The Impact of Blockholders on Information Signalling, Productivity, and Managerial Disciplining

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Proefschrift

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Jana Fidrmuc-Paľagová,

geboren op 20 maart 1970 te Nitra,
Tsjecho-Slowakije

Promotor:	Prof.dr. P.W. Moerland
Copromoteres:	Dr. R. Kabir
	Dr. L.D.R. Renneboog

To my sons Jan and Daniel

“Our dreams are our own, and only we can know the effort required to keep them alive.”

Paulo Coelho

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Contents

Chapter 1
Introduction*

Corporate governance deals with the ways in which suppliers of finance to corporations assure themselves of getting a fair return on their investment (Shleifer and Vishny, 1997). Within this very broad topic, the role played within the modern corporation by large-block shareholders has become an increasingly important and popular issue. It has been believed until recently that large shareholders are important only in the continental corporate world. However, recent empirical studies show that relatively large blockholders control important parts of corporations also in Anglo-Saxon, market oriented economies (see, for example, La Porta et al., 1999, Barclay and Holderness, 1989, and Franks et al., 2001). Thus, blockholders are part of the corporate world around the globe. This fact provokes many interesting questions concerning the reasons for their existence, their role, their incentives and goals, and most importantly their value for other stakeholders.

Numerous theoretical papers point out the benefits as well as costs of the presence of large blockholders in corporate world. A very important value-increasing activity of large blockholders is monitoring of corporate activities. Admati et al. (1994) and Maug (1998) show that costly monitoring takes place despite free-rider behaviour of small shareholders. Furthermore, the presence of a large blockholder makes a value-increasing takeover

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attempt more likely (Shleifer and Vishny, 1986). Jensen and Meckling (1976) argue that interests of managers and shareholders become increasingly aligned as managerial ownership increases. Still, costs associated with concentrated ownership may also be substantial. Block ownership reduces market liquidity (Maug, 1998) and risk sharing (Admati et al., 1994). Also, monitoring can have negative externalities. For example, Jensen and Meckling (1976) point out that monitoring can lead to excessive risk taking in managerial decisions. Burkart et al. (1997) argue that monitoring leads to ex ante reduction in managerial effort. Empirical literature (Holderness and Sheehan, 1988) documents that contrary to the general opinion, expropriation or consumption of corporate resources is not the main reason for the existence of majority shareholders. Rather, the benefits from controlling their firms seem to play a crucial role. Barclay and Holderness (1989, 1992) argue that positive price reaction to block trades in the U.S. documents expectations of improved management and/or monitoring despite the fact that private benefits are also consumed along the process. To the contrary, Franks et al. (2001) argue that in the U.K., neither existing shareholders nor large share blocks exert discipline or provide monitoring.

In this thesis, I undertake to analyze the role of large-block shareholders from two distinct perspectives. In the first part, I investigate the role large-block shareholders play in the U.K. – a developed economy with a long tradition of dispersed ownership. I analyze the market's response to blockholders' presence in corporate structures. In particular, I propose and test a hypothesis that corporate control structures are reflected in the market reaction to insider trading. The second part of the thesis investigates the role of new private investors in restructuring former state-owned enterprises in a transition economy. In transition economies, the need for efficiency improvements, for which high managerial effort and skills are required combined with high uncertainty about future developments and information asymmetry, highlights the importance of effective corporate-control structures. Companies and stakeholders have to improvise and find substitutes for disfunctioning market institutions (such as, contract enforcement, reputation, product-market competition, and managerial labour market). Concentrated ownership seems to provide the solution. These two views of the issue provided in the two separate parts of the thesis are highly complementary and provide broad evidence on the topic of large

shareholders. The following two sections provide a short summary and main conclusions of the two parts.

1.1 Large blockholders, corporate control and insider trading in a market economy (Part I)

The main contribution of the first part of my thesis is that is connects two important broad finance topics – trading of insider in shares of their own firms and corporate governance. In particular, it explores corporate-control determinants of information content of insider trades in the U.K. Corporate insiders, defined as managers, members of the board of directors, and large shareholders of publicly traded corporations tend to possess superior information about their company relative to small, dispersed shareholders. This informational advantage of corporate insiders relative to outsiders and its exploitation through insider trading has raised many questions concerning the fairness and efficiency of the financial markets and produced a huge body of theoretical and empirical literature. Chapter 2 provides a literature review of the main issues. I discuss (i) costs and benefits of insider-trading regulation; (ii) abnormal profits from trading to insiders; (iii) abnormal profits to mimicking outsiders; (iv) determinants of profitable insider trades; (v) insider trading and economy-wide developments; and (vi) insider-trading timing strategies.

Chapter 3 analyzes the immediate market reaction to directors' transactions for companies listed on the London Stock Exchange during 1991 to 1998.[1] The results support previous findings that directors' trades convey new information on the firm's future prospects (see, for example, Seyhun, 1986, and Lakonishok and Lee, 2001, for the U.S. and Friederich et al., 2002, for the U.K.). Both directors' purchases and sales trigger significant abnormal returns in the days immediately after their announcement, though the market reaction to purchases is higher. Markets seem to discount the information content

[1] The chapter analyzes directors' dealings – legal trading by the members of the board of directors of the company as defined in the listing rules of the London Stock Exchange (Source Book August 2002, Chapter 16).

of sales more as part of the directors' sales may be caused by liquidity and diversification needs of the directors.

The main contribution of the study, however, is the analysis of the impact of corporate control on the information content of directors' dealings. To our best knowledge, no previous study has explored this relationship so far. In particular, we analyze the impact of presence of different blockholder types on the cumulative abnormal returns (CARs) immediately after the announcement of directors' transactions.[2] It is argued that the market takes into account the firm's corporate control characteristics when reacting to the information embedded in the directors' transactions. For example, a director trade may have relatively less informational value in a firm owned by an outside blockholder who monitors than in a firm with dispersed ownership that is subject to a more substantial asymmetry of information. Our results confirm this notion. In general, the capital market differentiates between outsider and insider ownership and also, between blockholders who monitor the management and those who do not. If corporations, or individuals or families unrelated to the management are blockholders, then the market reaction to directors' purchases is mitigated. This suggests that these types of blockholders reduce informational asymmetry. In contrast, the presence of institutional investors triggers the reverse effect: the market reacts more positively following directors' purchases and more negatively following directors' sales. Thus, institutional investors do not reduce the information gap between investors and directors, but they rather follow directors' trades.

Furthermore, our results confirm that markets perceive directors' entrenchment and accountability as an important factor adjusting the informational content of directors' transactions. For firms with significant directors' stakes, the positive news contained in directors' purchases is mitigated by the danger that directors become more entrenched and hence less accountable. At the same time, the market reacts less negatively when directors sell (part of) their shares when they own significant blocks of shares as this reduces the likelihood of their entrenchment. In general, increases in directors' ownership are recognized as a negative signal, whereas decreases are perceived as positive news. Finally, we find stronger market reactions when firms are performing poorly (making losses or decreases its dividends) or are close to financial distress (low interest coverage).

[2] For definition of CARs see Section 3.4.1.2.

1.2 The role large shareholders in a transition economy (Part II)

The second part of this thesis deals with the actions that new private owners in the Czech Republic undertook immediately after the privatization in order to improve efficiency and profitability of the former state-owned enterprises. Privatization of socialist state-owned enterprises was an important part of the reform program in all transition countries that intended to transform their economies from centrally planned systems to market-driven economies. It is widely acknowledged in the economic profession that private ownership is the crucial source of incentives for corporate innovation and efficiency (Shleifer, 1998). Moreover, Shleifer and Vishny (1994) argue that public enterprises are highly inefficient since they are under pressures from the politicians who control them to pursue political goals. Introduction of private owners removes these pressures and reinstalls the profit-maximization goal that leads to efficiency improvements and innovation. Megginson and Netter (2001) and Djankov and Murrell (2002) review many recent empirical papers documenting that privatization is highly successful in delivering performance improvements.

After the fall of the communist regime in 1989, the Czechoslovak government opted for fast liberalization/reform program (shock therapy) that aimed to introduce the three essential steps – price liberalization, stabilization and privatization – at a very high speed (Sachs, 1993). Voucher privatization that allowed for a relatively speedy transfer of ownership rights to private entities was designed as a very important part of the program. Chapter 4 positions the voucher scheme as a part of the whole privatization process in the Czech Republic, stresses its main features and highlights its main consequences for future developments at the micro level as well as at the equity-market level.

Transfer of ownership to private hands together with increased competition, and hardening of budget constraint should have motivated former state-owned enterprises to reorganize their activities so that they become efficient and profitable. Chapters 5 and 6 analyze these restructuring activities of the voucher-privatized Czech firms in the post-privatization period and attempt to evaluate the effectiveness of these restructuring activities using a data set covering some 917 firms over the period from 1993 to 1998. First, Chapter 5 focuses on turnover at top managerial positions and evaluates

performance effect of such events. Second, using a production-function framework, Chapter 6 analyzes the effect of a wide range of restructuring activities on total factor productivity of the privatized firms.

In market economies, firm performance typically affects decisions concerning the CEO's tenure in the firm. In Chapter 5, we test whether or not the new private owners in charge of selecting firm managers in the Czech Republic are influenced by the prior relative performance of their firms. If this is the case, managers of firms that perform poorly relative to other industry members should have higher probability to be replaced. Our results show that the impact of firm performance on the probability of CEO change is not significant in the first couple of years directly after the transfer of ownership rights. However, the performance effect becomes significant for CEO changes in 1997, some 3-4 years after the privatization. This effect is profound in firms with less concentrated control and firms where investment privatization funds are important blockholders. This may stem from the fact that more concentrated stakeholders are more involved in running of their companies and have, consequently, more information concerning qualities of the incumbent managers. Thus, they may replace their managers when there is a potential for performance improvement even though the firm's relative performance measures (compared to other firms in the same industry) do not suggest underperformance.

Our second finding confirms this proposition. When comparing productivity before and after the managerial change, we find that CEO change indeed delivers a positive shift in (total factor) productivity. This suggest that the new private owners act on their superior information regarding the unfulfilled potential for efficiency improvement of their firms and are able to appoint managers whose human capital better matches the firm's productive assets. However, our third important conclusion is that the positive effect of CEO turnover is significant only when the CEO has a relatively strong position within the firm and is closely linked with the board of directors (which is ultimately responsible for all business affairs of the company). Also, replacements of the chairman of the board of the directors seem to be important efficiency improving events in this type of firms. To the contrary, replacements of the CEO or chairman of the board do not improve productivity when the management is relatively weak and the board-of-directors members are (mostly) non-executive representatives of the shareholders. In short, Chapter 5 provides evidence

that the newly established owners in the former state-owned enterprises in the Czech Republic are quite active in looking for new managers with better human capital who, consequently, improve productivity of their firms.

For transition economies, the literature documents a wide variety of restructuring activities among state-owned enterprises in the pre-privatization period (see, for example, Carlin et al., 1996, and Agion et al., 1994). Chapter 6 provides an analysis of channels of restructuring in the post-privatization period on a panel of Czech voucher-privatized companies. The results indicate that asset sale, employee incentives, and CEO change serve as channels through which (total factor) productivity of the privatized companies is improved. To the contrary, capital expenditure and inventory management are not found to be significant determinants of enterprise productivity. Furthermore, the analysis suggests that availability of bank loans does not have any effect on productivity, which can be interpreted as indication of soft budget constraint imposed on the companies.

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PART I

Chapter 2
Insider Trading: Background and Literature Review

2.1 Introduction

Corporate insiders, defined as managers, members of the board of directors, and large shareholders of publicly traded corporations tend to possess more information about their company than small, dispersed shareholders. This informational advantage of corporate insiders relative to outsiders and its exploitation through insider trading raises many questions concerning the fairness and efficiency of the financial markets (Leland, 1992). Lakonishok and Lee (2001) document that in the U.S. insiders frequently trade in the shares of their firm. Using a data set covering all the companies traded on the NYSE, Amex, and NASDAQ over the period from 1975 to 1995, the authors show that there is some insider trading in more than 50 percent of the stocks in each year. On average, insider purchases (sales) per year amount to 0.6 percent (1.3 percent) of their company's market capitalization. Furthermore, insider purchases of shares through the exercise of options and open market sales have significantly increased in the 1990s.

As Jeng et al. (1999) state: *"There are three good reasons to study the profitability of trades by corporate insiders: science, profit, and policy. Science examines the implications of the findings for market efficiency. Profit hopes to develop optimal trading strategies. Policy seeks to determine the effectiveness of insider trading rules, and the implications of insider profitability for both fairness and market performance."* These

issues have been studied in a substantial body of empirical, but also theoretical research. This chapter provides an overview of the main issues regarding insider trading in the law and economics literature so far: (i) insider-trading regulation; (ii) abnormal profits from trading to insiders; (iii) abnormal profits to mimicking outsiders; (iv) determinants of profitable insider trades; (v) insider trading and economy-wide developments; and (vi) insider-trading timing strategies. The main flavour of all these issues is provided in the text below whereas broad discussion follows in the individual sections.

A large body of theoretical models focuses on the fairness and desirability of these transactions and the consequences for insider-trading regulation. The models normally analyse the costs and benefits of insider-trading regulation for insiders and investors. Empirical evidence supports arguments both for and against insider-trading regulation and highlights the complexity of this issue.

The most researched empirical issue regarding insider trading is the market reaction to insider transactions. On one hand, one can argue that, given that insiders possess superior information, it motivates them to trade in stock of their own firms and profit using this information. Significant long-term abnormal profits (over 6 to 12 months) to insiders following trades in their own companies demonstrate that insiders do indeed possess superior information. On the other hand, it can be argued that, given that the stock market is efficient and insiders possess superior information, the announcement of insider trading should be followed by an almost immediate market adjustment of prices. In general, these empirical tests document significant abnormal profits to insiders.

Another related and equally important issue is the existence of abnormal profits to outsiders who based on publicly available information mimic the insiders' trades. It is argued that if outsiders were able to profit following such mimicking strategies, it would constitute a serious threat to the semi-strong market efficiency hypothesis. The semi-strong efficiency hypothesis basically implies that nobody can earn abnormal profits using public information. Many studies show statistically and economically insignificant profits to mimicking outsiders.

Several studies try to identify determinants of profitable insider trades. In general, it is shown that larger abnormal profits are associated with insiders who are closely engaged in the business of their company. Also, smaller firms are expected to have higher

informational asymmetry and more profitable insider trades. Intensive insider trading in terms of bigger transactions (number of shares traded) and multiple simultaneous trades results in higher profits.

Another interesting hypothesis relates superior insider information and insider trading to subsequent economy-wide developments. In particular, it is conjectured and documented that insiders are able to predict future economy-wide movements: when insiders are optimistic (predominantly purchase shares of their own firms), the subsequent aggregate market return increases. To the contrary, when they are pessimistic, markets do poorly (decrease). Further tests show that insiders in aggregate are contrarian investors but predict future market movements well.

The information content of insider transactions is also explored by studying insider-trading strategies around firm earnings announcements. Insiders seem to postpone their trades until after important announcements (passive trading strategy) rather than trading on their information before the announcements (active strategy).

The rest of the chapter is organized as follows. The next section describes the main features of the U.S. and U.K. insider-trading regulation. Section 2.3 focuses on theoretical and empirical evidence concerning insider-trading regulation. Section 2.4 surveys the extensive empirical evidence on market reaction to insider trading and aggregate insider-trading effects are discussed in Section 2.5. Section 2.6 concentrates on insider timing strategies and managerial compensation, respectively.

2.2 Insider trading regulation in the U.S. and U.K.

In the U.S., the Securities Exchange Commission (SEC) is the governmental body in charge of regulating insider trading. Legal restrictions on insider trading are formulated in the 1934 Securities and Exchange Act and its amendments. Corporate insiders, such as officers[3], directors, and other key employees, are required to refrain from trading on 'material' undisclosed information and to fill in statements of their holdings in the first ten days of the month following the month in which the trade occurred (Persons, 1997).

[3] The term 'officer' includes company president, principal financial officer, principal accounting officer, any vice president in charge of any principal business unit, division, or function (such as sales, administration, or finance), and any other person who performs a policy-making function for the company (Bettis et al., 2000).

Shareholders who hold more than 10 percent of any equity class must also report their trading activity to the SEC. The SEC publishes these transactions in its monthly *Official Summary of Insider Transactions*. However, investors learn about insider transactions sooner. Chang and Suk (1998) report that the primary information dissemination concerning corporate insiders' trades is when the insider-trading information becomes available to investors through an online service or in the SEC reading room. This is usually on the same day as the transaction was performed. Shortly after, information about insider trading appears in the Wall Street Journal or other financial press. Finally, it is published in the SEC's *Official Summary of Securities Transactions and Holdings*. Profits that insiders made on short-term swings in prices (formally within six months) must be repaid to the company. In general, the essence of the existing laws on insider trading in the U.S. is that insiders must either abstain from trading on such information or release it to the public before they trade (Hu and Noe, 1997).

Prosecution of insider trading was not very common until the last two decades of 1900s (Hu and Noe, 1997). In 1975, the 1934 Act was amended to increase the maximum criminal penalty and the maximum prison sentence. The 1984 Insider Trading Sanctions Act and 1988 Insider Trading and Securities Fraud Enforcement Act further increased the penalties for illegal insider trading. This resulted in an increased number of insider-trading cases. Meulbroek (1992) reported that the SEC prosecuted more than 400 cases of insider trading between 1980 and 1989.

To the contrary, U.K. regulators have taken a different approach. The insider trading regulation contained in the Model Code of the London Stock Exchange and the 1985 Companies' Act is stricter than the corresponding regulation in the U.S. (Hillier and Marshall, 1998). Directors (all members of the board of directors) must inform their company as soon as possible after the transaction and no later than the fifth business day of any transaction carried out for their personal account (Friederich et al., 2002). In turn, a listed company must inform the Stock Exchange of the transaction without delay and no later than the end of the business day following receipt of the information by the

company.[4] The Stock Exchange disseminates this information immediately to data vendors as well as via its own 'Regulator News Service'. The company should also enter this information in the Company Register, which is available for public inspection within three days of reporting by insider, but this way of disseminating the information is nowadays much less important. An important difference with the U.K. regulatory regime is that in the U.S., insiders are more broadly defined and also include large shareholders.

Additional insider-trading restrictions in the U.K. stem from the fact that directors of the companies traded on the London Stock Exchange are prohibited from trading for two months prior to a final or interim earnings announcement and one month prior to a quarterly earnings announcement. Furthermore, outside the restricted periods, directors are required to receive clearance to trade from the chair of the board of directors. According to Hillier and Marshall (1998) insider trading is almost non-existent for a two-month period prior to the final and interim announcements. In general, there is no such regulation in the U.S. Lustgarten and Mande (1995) show that the volume of U.S. insider trading declines as an earning announcement approaches but it does not decline to zero. The U.S. system seems to favour frequent disclosure to remove possible insider advantages while the U.K. system prefers less frequent disclosure accompanied by a ban at price sensitive times (Hillier and Marshall, 2002).

It should be noted, however, that besides the federal regulation, a large fraction of U.S. firms impose additional insider-trading restrictions on their directors and officers (Bettis et al., 2000). In particular, Bettis et al. (2000) report that in 1996 as much as 92 percent of their sample firms had some type of policy regarding insider trading and 78 percent of the sample firms had explicit blackout periods during which the company prohibits trading by its insiders. The single most common policy disallows trading by insiders at all times except during a trading window that is open during the period 3 through 12 trading days after the quarterly earnings announcement.

[4] This indicates that information about an insider transaction reaches the market as late as 6 days after the transaction. However, in reality this information is revealed faster since directors of listed companies are required to get clearance before each transaction from the chair of board of directors.

2.3 Costs and benefits of insider trading regulation

An important part of the insider-trading discussion among the law and economics scholars is the question regarding fairness of insider trading and usefulness of insider-trading regulation. Several analytical models show the costs and benefits of insider-trading regulation. Is it more beneficial for the society to regulate (prohibit) transactions of insiders in the shares of their own firms? Or, to the contrary, is it more efficient to leave managers to trade these shares freely?

2.3.1 Theoretical models

Economic analysis of insider trading usually considers four parties: insiders, informed market professionals, liquidity traders, and investors (Hu and Noe, 1997). Insiders, as defined by the law, are the officers and directors who obtain confidential information due to the nature of their employment. Market professionals are informed outsiders, such as securities analysts, brokers, or arbitrageurs, who spend their own resources to acquire private information. Liquidity traders are short-term stock market participants who trade in order to hedge risk or balance their portfolio. They usually have only a limited share stake in the firm. Finally, investors are shareholders who have a long-term interest in the firm; they 'buy and hold.' The law and economics literature tries to weigh the costs and benefits for these different groups affected by insider trading.

In general, two main theoretical approaches are used to discuss the costs and benefits of insider trading: agency theory considers only insiders and investors whereas market theories look at the aggregate economic effects of insider trading (Beny, 1999). According to agency theory, insider trading represents an efficient form of managerial compensation because it reduces the conflict of interest between managers and shareholders and increases managers' incentives to engage in value-maximizing activities (Manne, 1966, Bebchuk and Fershtman, 1993, Hu and Noe, 2001). In contrast, Noe (1997) shows that relaxation of insider trading restrictions may lead to a lower lever of managerial effort as inefficient private benefits of control accrue to insiders at outsider shareholders' expense.

Market theories put costs and benefits of insider trading into a broader perspective of equity markets. Leland's (1992) pioneering model on the topic shows that permission of

insider trading has several concequencies: stock prices better reflect information and are higher on average, expected real investment rises, markets are less liquid, owners of investment projects and insiders do benefit, and, finally, outside investors and liquidity traders are hurt. Total welfare may increase or decrease depending on the economic environment. This model has inspired a quite extensive body of analytical models that further develop the individual issues raised in Leland (1992). Proponents of unregulated insider trading claim that insider trading contributes to the overall market efficiency because it enables prices to reflect information more accurately such that firms do not have to rely on more costly traditional forms of disclosure (Carlton and Fischel, 1983). This impounding of information allows shareholders to make better personal portfolio allocations (Hu and Noe, 2001). Opponents argue that unregulated insider trading reduces the overall level of market efficiency: it may hamper investor confidence and, hence, participation in equity markets (Ausubel, 1990), distort managers' incentives to engage in timely disclosure of information (Kraakman, 1991), discourage the production of information by outside analysts and, thus, reduce the net informational efficiency of a stock market (Fishman and Hagerty, 1992), and, finally, reduce market liquidity for firm's stocks leading to higher cost of capital (Copeland and Galai, 1983).

Shin (1996) provides an interesting insight concerning insider-trading regulation that indicates that direct restrictions of insider trading are not the only way to reduce negative consequences of insider trading on liquidity traders in the market. His model shows that when the regulator pursues the objective of minimal losses to liquidity traders, he can either directly restrict insider trading, or, with the same effect, allow more market professionals to enter the market (so that they compete with insiders) and enforce higher information disclosure. Competition between market professionals and insiders in using their information will influence the stock price, improve informational efficiency, and may also reduce trading losses to liquidity traders.

The social welfare impact of insider trading is analyzed in Estrada (1995). He shows that insider trading regulation has both beneficial and detrimental effects on a security market. Insider trading regulation has positive effect on market liquidity and current-price volatility, and a detrimental effect on future-price volatility, informational efficiency and price predictability. However, he shows that insider-trading regulation has a negative

impact on society as a whole – social welfare is higher when insider trading is not regulated. This is because in an unregulated market (i) the price volatility is lower, and the market is consequently less risky; (ii) insiders bear part of the price risk and there is increased risk sharing among investors in the market; and (iii) no resources are diverted to the enforcement of insider trading regulation, so, no production is foregone in this market. In short, Estrada (1995) shows that imposition of insider-trading regulation forces a reallocation of wealth and risk that decreases social welfare. In contrast, Ausubel (1990) using a competitive market framework concludes that society is better off when insider trading is restricted. However, price-taking behaviour in a competitive market may not be the adequate framework to analyze issues of informed trading since transactions based on private information tend to be rather large and move prise significantly (Estrada, 1995).

The divergence of conclusions of the different models stems from disagreement over which effects of insider trading would have the most significant impact on economic well being (Hu and Noe, 1997). In summary, there is a large degree of consensus regarding the following issues. First, whenever other informationally advantaged investors are absent or insignificant, insider trading increases losses to investors and liquidity traders and makes the markets less liquid. Second, unless other informed traders are forced out of the market, insider trading has positive effect on price informativeness and market efficiency, and potentially improves capital budgeting decisions. Third, insider trading provides low-cost and effective incentives for managers. However, insider trading also encourages managers to undertake risky projects. At the same time, insider trading substitutes for explicit forms of compensation (e.g. salary and bonuses) that themselves may lead to satisfactory managerial performance and reduced risk taking.

2.3.2 Empirical evidence

The debate on the cost and benefits of insider-trading regulation is supported by several empirical studies. A majority of papers argue against insider-trading restrictions and document, the positive impact of the insiders' transactions on information available in the stock market. To the contrary, proponents of insider-trading regulation show evidence concerning decreased liquidity and increased trading costs.

Kabir and Vermaelen (1996) exploit an interesting opportunity for a controlled experimental setting that was provided by the introduction of insider-trading prohibition two months before an annual earnings announcement for firms listed on the Amsterdam Stock Exchange since 1987. They document that trading volume decreased (stocks became less liquid) during the two months when insiders were not allowed to trade. Moreover, their results indicate that introduction of insider-trading restrictions resulted in slower market adjustment to positive earnings news. Overall, this analysis provides evidence against insider-trading regulation as it decreases liquidity and informativeness of the stock market.

Lustgarten and Mande (1998) also argue against insider-trading prohibition as they show that insider trading provides additional information to the market participant which increases market efficiency. Their study also documents that the announcement of insider trading increases the amount of information available to financial analysts who forecast corporate earnings. In particular, insider purchase announcements have a diminishing impact on the dispersion of financial analysts' earnings forecasts and magnitude of analysts' earnings errors.

A similar argument regarding the information revelation via insider trading is put forward in Givoly and Palmon (1985). They state that a large part of the abnormal performance of insider trades is due to price changes arising from the information revealed through the trades themselves, lending support to the conjecture that investors accept the superior knowledge of insiders and follow the insiders' footsteps (the leading-indicator effect). A major shortcoming of the paper, however, is that it does not recognize passive trading strategies by insiders. That is, the analysis tries to identify news announcements that follow insider trades but ignore announcements that precede them. It has been shown, however, that insiders are more inclined to trade passively – following news announcements – rather than actively (Lustgarten and Mande, 1995).[5] Nevertheless, passive trading strategies of insiders, which oppose the news of the earnings announcement, were shown to earn significant abnormal returns that more than cancel out the announcement information effect (Hillier and Marshall, 2002). This finding supports Givoly and Palmon's claim that a large part of the abnormal performance of insider trades

[5] Active and passive trading strategies are described in more detail in Section 2.6.

is likely to be due to price changes arising from the information revealed through the trades themselves.

Meulbroek (1992) argues that insider trades in her sample, which SEC has alleged as based on superior inside information (were labelled as illegal), provided the market with information before it was officially announced and they increased market informativeness and price efficiency. In particular, Meulbroek (1992) documents that insider trading is associated with immediate price movements and quick price discovery. Thus, insider trading transmits private information and increases the accuracy of securities prices. Further analysis indicates that both the amount traded by insiders and trade-specific characteristics (such as trade size, direction, and frequency) signal the presence of an informed trader to the market, which Jabbour et al. (2000) also confirm for a sample of Canadian corporate takeovers.

Persons (1997) argues in favour of insider-trading regulation. He studies the market reaction to announcement of Security Exchange Commission's insider trading enforcements, defined as illegal insider transactions being prosecuted by the SEC, and documents that the announcement of the enforcement action negatively affects the firm's stock value. This negative effect may stem from the fact that firms usually incur a significant amount of expenses as a result of the SEC's investigation (litigation expenses and settlement payments), and the enforcement may also provide justified grounds for subsequent stockholders' lawsuits that may negatively influence future cash flows. Moreover, it is also highly probable that the enforcement action also damages the firm's reputation, and leads to an increase in its cost of capital. Further analysis indicates that larger illegal insider profits are followed by stronger negative market reactions. In summary, Persons' results demonstrate that prosecution of illegal insider trading is costly for involved companies. This implies that the SEC sanctions may encourage insiders to abstain from illegal insider trading. Still, in this respect, the deterrence effect of an SEC prosecution depends on who bears the costs of prosecution and how probable it is for an insider that the illegal trade is discovered and prosecuted.

Further indirect evidence supporting insider-trading regulation – or rather self-regulation – is presented in Bettis et al. (2000) who show that a large fraction of U.S. firms self-regulate insider trading of their directors and officers. Over 92 percent of firms in

their sample have some type of policy regarding insider trading, and 78 percent of their firms have explicit trading bans, periods during which insiders are not allowed to trade. The authors provide two competing explanations for existence of these self-regulating restrictions. First, it is possible that these corporate policies limiting insider trading are a public relations ploy, providing legal protection for the firm and the firm's insiders without having any detectable effect on insider-trading behaviour or the liquidity of the firm's shares. A second explanation is that these policies are structured to either minimize costs (litigation costs and costs associated with lost managerial time, business disruption, and negative publicity) or to improve the liquidity of the market for firm's shares. Empirical pricing results support the latter explanation. Corporate trading prohibitions in the form of blackout periods are associated with a significant reduction in insider trading. In the blackout periods, insider-trading activity is less than one-third of that during allowed trading periods. Furthermore, lower insider-trading activity during trading bans brings about lower bid-ask spreads and greater liquidity during these periods compared to allowed trading days.

Beny (1999) provides further empirical support for the relationship between insider trading regulation and market liquidity. She documents that for a cross-section of countries, tougher insider trading laws are positively associated with market liquidity (market turnover ratio). Moreover, she shows that the ability of insiders to engage in unrestricted trading encourages concentrated share ownership.

2.4 Market reaction to insider trades

The most empirically explored issue within the insider-trading literature is the amount of superior information available to insiders. The question whether insiders indeed posses special information concerning future prospects of their firms can be approached in two ways. First, as insiders possess superior information, it motivates them to trade in stock of their own firms and profit using this information. Consequently, significant long-term abnormal profits (over 6 to 12 months) to insiders would constitute a proof of insiders' superior information. Second, as the stock market is efficient and insiders possess superior information, the announcement of insider trading should be followed by a prompt market

adjustment of prices. Hence, the information content of insiders' trades can be alternatively tested by an immediate market reaction to announcement of insider transactions.

Another frequently explored question closely associated with insider trading is the existence of positive profits to outsiders who mimic insider trades. This issue is quite intriguing since positive abnormal profits (net of transaction costs and bid-ask spread) to certain strategies of mimicking outsiders would also be inconsistent with market efficiency.

2.4.1 Long-term profitability of insider trades

Jaffe (1974) is the first study that uses a sound event study methodology and attempts to resolve the issue concerning the possession of superior information by corporate insiders and profitability of their trades. Some earlier studies find evidence that insiders can the predict price movement in their own securities (Rogoff, 1964; Glass, 1966; and Lorie and Niederhoffer, 1968) but others find no evidence of successful insiders' forecasting (Wu, 1963 and Driscoll, 1956). Jaffe, using monthly abnormal returns after insider trades in the largest companies traded in the U.S. over the period from 1962 until 1968, documents that insiders do indeed trade on privileged information. In particular, he shows that over a period of 1 to 8 months following the month of trading insiders earn statistically significant abnormal profits that range from 0.6 percent to 1.4 percent. The analysis of large trades and of months of intensive trading yield even stronger results. Nevertheless, outsiders would earn profits greater than commissions only by following insider trades in the intensive trading months.[6] Finnerty (1976) uses the CAPM model to test for profitability of insider transactions. His results also indicate that insiders can outperform the market: they earn above average returns when buying shares of their own firms and when they sell shares, prices fall more than the general market decline of the period.

[6] A month is an intensive (purchase) trading month if the number of purchases is at least 3 times bigger than the average number of sales, and conversely, in an intensive (sales) trading month, the number of sales is at least 3 times bigger than the number of purchases.

Seyhun (1986) reinvestigates stock price behaviour following the insiders' transactions using daily data and event study methodology with the market model as a benchmark. He argues that the CAPM-model benchmark, used in the previous studies, results in potential biases in measuring expected returns to securities. In particular, the CAPM-based residuals are on average positive for small firms and negative for large firms (Banz, 1981 and Reinganum, 1981). This means that if insiders have predominantly more purchases than sales in small firms, biases in the CAPM may result in positive abnormal returns following insider purchases. Seyhun documents that insider trading is profitable and that most of the abnormal stock price adjustment occurs during the first 100 days following the insider-trading day: stock prices rise abnormally by 3.0 percent (t-statistic 4.4) for purchases and decline abnormally by 1.7 percent (t-statistic –2.7) for sales. His results also document that insiders are able to time their trades properly and strategically. On average, insiders' purchases follow a previous stock price decline (1.4 percent, t-statistic –2.1) and insiders sell following a previous stock price increase (2.5 percent, t-statistic 4.0).

Moreover, Seyhun (1986) explores also abnormal profits to outsiders who mimic the insiders' transactions. The novelty of his analysis is the use of the actual dates insiders first report their transactions to the SEC and the dates when insiders' trading information is published in the Official Summary.[7] The results indicate that if outsiders trade on the basis of insiders' transactions as soon as the SEC receives insiders' reports, they can earn 1.4 percent after 100 days and 1.9 percent after 300 days. If the outsider waits until after the Official Summary is available, then the gross abnormal return is only 1.1 percent during the next 300 days. However, after the adjustment for the bid-ask spread plus transaction costs for a round trip transaction, the realizable abnormal profits to outsiders imitating the insiders' trades are non-positive.[8] This evidence is consistent with market efficiency. Insiders possess superior information and can predict future abnormal stock price changes. Market efficiency is, however, not challenged, as net of trading costs

[7] Previous studies generally assume that all insider-trading information becomes publicly available within two months. This can cause substantial biases in the measurement of the announcement effect.

[8] The bid-ask spread plus the commission is taken as 6.8 percent for firms less than $25 million, 5.2 percent for firms between $25 and $50 million, 3.7 percent for firms between $50 and $250 million, 3.2 percent for firms between $250 million and $1 billion, and 2.7 percent for firms greater than $1 billion. These numbers correspond to the Stoll and Whaley (1983) estimates.

mimicking outsiders cannot earn abnormal profits following the public dissemination of insider-trading information.

Rozeff and Zaman (1988) argue that since the estimates of abnormal returns depend on the size and price/earnings ratio of firms, abnormal returns measuring profitability of insider trades should be properly adjusted for these effects. Their results show that after the size and earnings/price effects adjustments,[9] the abnormal profits to insiders are reduced by 25-50 percent. When transaction costs of 2 percent are imposed, the only profitable trading horizon is the 12-month horizon and the level of profits is 0.26 percent per month or 3.12 percent per year. Also, profits to outsiders who mimic insiders' trades are similarly reduced. In particular, the outsider trading profits are close to 0.5 percent per month or 6 percent per year when using the traditional market model. However, after adjustment for the size and earnings/price effects, the abnormal returns are reduced to about 0.3 percent per month at horizons of 3-12 months. Moreover, an additional assumption of 2 percent transaction costs makes outsider profits zero or negative. The authors conclude (p.43): *"Our empirical findings do not strongly support the view that corporate insiders have information that the market does not have, for, if it is true that corporate insiders posses such inside information on a routine basis, the evidence does not suggest that they earn substantial profits from directly using this information in stock trading."* However, it is probably the case that the market reacts to the news of insider trading directly after it is made available to the public. The event window of 1 to 12 months after the transaction month may be too wide and too far from the actual event. It may be the case that the findings of this paper actually confirm the hypothesis that the market reacts to the news of insider trading immediately and fully within the month of the transaction.

Lin and Howe (1990) examine the profitability of insider trading in firms whose securities trade in the OTC/NASDAQ market. This is of importance because the market microstructure of the OTC market is different from that of organized exchanges. The multiplicity of market makers may allow insiders to more carefully conceal their trades.

[9] The market model is adjusted using a control portfolio approach that simulates the abnormal returns that an uninformed investor could earn by taking into account the size and earnings/price effects. Monthly returns are used.

Moreover, transaction costs are higher for OTC-listed firms. Finally, the firms traded in the OTC market are relatively small. Smaller firms are less closely monitored by financial analysts and institutional investors, which might cause a greater degree of informational asymmetry. The results (using monthly abnormal returns) suggest that also insiders of the OTC/NASDAQ firms trade on privileged information. The abnormal returns after six and 12 months following the trades are about 2-3 percent and are statistically significant. However, high transaction costs (especially bid-ask spreads) appear to eliminate the potential for positive abnormal returns to outsiders mimicking insiders' trades. The overall conclusion of Lin and Howe (1990) is that the profitability of insider trading in the OTC market is not much different from that in the organized exchanges.

Bettis et al. (1997) dispute the findings of Seyhun (1986) and Rozeff and Zaman (1988) of insignificant abnormal profits to outsiders mimicking insiders' transactions. Bettis et al. (1997) show that outsiders could profit by following the transactions of corporate insiders. In particular, their profitable trading strategy prescribes to follow large-volume trades by high-ranking insiders on NYSE and Amex. Transaction-cost adjusted cumulative abnormal returns to outsiders following this strategy for insider purchases span from 2.95 percent after 26 weeks to 6.96 percent after 52 weeks. For sales, this strategy earns 2.05 percent after 26 weeks and 4.86 percent after 52 weeks. All of these results are highly significant.

It is important to note, however, that the stronger results of the more recent study by Bettis, Vickrey and Vickrey (1997) may also stem from improved information technology (online database) available to investors in recent years: the insider-trading information is made publicly available significantly faster, usually only one or two days following the SEC filing day. Another possible explanation is that assumptions concerning the reporting delay (time elapsed between the actual trade and its announcement) in the two previous studies (Seyhun, 1986 and Rozeff and Zaman, 1988) may also have biased their results. The reporting delays are substantially higher in Seyhun (1986) and Rozeff and Zaman (1988) than in Bettis et al. (1997). Too long reporting delays may cause that the event window is too far from the actual dissemination date and that some potentially viable trades by outsiders are ignored. This may also mean that even though the new information moves the market prices significantly, this happens out of the event window and implies

too low reported abnormal profits. The last explanation may stem from the fact that Bettis et al. (1997) separate purchases and sales and use weekly returns whereas Rozeff and Zaman (1988) pool all trades and rely on monthly CAARs.

Jeng et al. (1999) explore a comprehensive sample of reported insider transactions over a period from 1975 to 1996. Their analysis is based on value-weighted portfolios that are constructed by placing all insider purchases (sales) into the portfolio on the day they are made and are held for exactly one year. Returns to these portfolios are then analyzed using performance-evaluation methods.[10] The authors argue that this approach is free of the statistical difficulties that are connected with event studies on long horizon returns. The results suggest that insiders profit from purchases but not from sales. In particular, the purchase portfolio outperforms the market by about 7.4 percent per annum. About one-sixth of these abnormal returns accrue within the first five days after the trade, and one-third within the first month.

Lakonishok and Lee (2001) also provide evidence on long-term abnormal performance of insider trades. Without controlling for size and book-to-market effects, firms with high-volume insider buys during the prior six months outperform companies with high-volume sales by 7.8 percent. However, these findings depend on company size; large companies are priced more efficiently than small companies. After adjusting for B/M and size, the spread in returns is reduced to 4.8 percent over the first year.

King and Röell (1988) and Pope et al. (1990) are among the first to explore insider-trading profits in the U.K. context. In general, the results of Pope et al. (1990) are consistent with previous work for the U.S.; they document a considerable abnormal market reaction following insider dealings. In particular, the cumulative abnormal returns 6 months after the announcement of the directors' trades for purchases and sales are 4.85 percent, and are highly statistically significant. This is attributed to the abnormal performance of the sales portfolio rather than to the purchase portfolio.

Gregory et al. (1994) reassess the U.K. results adjusting the abnormal returns for size and thin trading effects. Their results suggest that abnormal returns can be earned by a

[10] The authors use three alternative performance evaluation methods: the standard CAPM model of Sharpe (1964) and Lintner (1965), 4-factor model of Carhart (1997), and the characteristic-selectivity measure method developed by Daniel et al. (1997). Two other studies that employ a similar approach are Finnerty (1976) and Eckbo and Smith (1998).

simple strategy of buying or selling shares following the disclosure of directors' trades.[11] However, adjustments for size and thin trading effects lead to an overall reduction of the abnormal profits. Insiders earn abnormal returns of 2.29 percent over 6 months and 6.01 percent over 12 months after purchasing additional shares (only the latter is statistically significant). In contrast, none of the sales-related abnormal returns are significant. All these returns become insignificant once transaction costs and bid-ask spreads have been allowed for. The authors conclude that the size effect is responsible for the apparently significant abnormal returns achievable from following directors' transactions. Once size is corrected for, the CAARs become statistically insignificant in the case of sell signals and less significant with buy signals. Still, the excess returns may well be lower than transaction costs.

The primary focus of Gregory et al. (1997) is to differentiate effects of various buy and sell signals resulting form insider transactions and, so, reconcile and extend the previous research on directors' dealings in the U.K. (King and Röell, 1988, Pope et al., 1990, and Gregory et al., 1994). Their insider-trading signals are defined according to the net value and net number of shares transacted. In summary, the results suggest that outsiders can indeed earn abnormal returns by following mimicking strategies. However, their conclusions regarding market efficiency should be interpreted with caution as the abnormal profits may still not be high enough to cover transaction costs of a full transaction round trip. First, using the monthly net volume of directors' trades as a signal leads to small but significantly positive abnormal returns of 2.16 percent and 2.88 percent after 6 and 12 months, respectively. The returns for the sales are statistically insignificant. Second, using the net number of directors' trades as a signal gives similar results. Finally, when the signal is refined to examine the importance of large-volume trades, absolute values of the cumulative abnormal returns for the purchase portfolio are smaller but still significant (1.14 percent and 0.48 percent after six and 12 months, respectively). However, on the sales side, the large-volume signals generate relatively large abnormal returns (–2.46 percent (significant) and –3.96 percent (not significant) after six and 12 months,

[11] The date of the signal to the market is the date on which the documentation provided by the company is reported by the stock exchange. If directors buy more shares than they sell, a buy signal arises whereas a sell signal is triggered if sales exceed purchases.

respectively). This shows that the market acknowledges asymmetry in the directors' purchases, liquidity sales and large sales which may be caused by other than liquidity reasons.

2.4.2 The immediate market reaction

Even though a majority of the empirical evidence on superior information by insiders regarding future prospects of their firms focuses on long-term profitability of insider trading, several studies complement these findings by providing evidence on the immediate market reaction to insider-trading announcements.

Jaffe (1974) is among the first to document that the publication of information in the SEC's *Official Summary of Securities Transactions and Holdings* moves prices significantly. The one-month CAAR after the announcement is 0.9 percent.[12] Likewise, Chang and Suk (1998) test secondary information dissemination effects at the stock market (by looking at the publication of the *Insider Trading Spotlight* column in the Wall Street Journal).[13] The results show significant abnormal stock performance of 0.39 percent at the SEC filing date, which is the primary dissemination day. In addition, the publishing day in the Wall Street Journal is also associated with a positive and significant market adjustment, the four-day CAAR following this day is 0.92 percent (significant at the one-percent level). Moreover, increased trading volume provides additional evidence of the existence of dissemination of information. Significant abnormal stock performance at the secondary dissemination day does not necessarily imply market inefficiency. Instead, it is more likely that individual investors consider the expected costs of obtaining new information from the SEC filing to exceed the expected benefits.

Lakonishok and Lee (2001) do not document any economically meaningful stock price reaction around the time when insiders trade or around the reporting dates. The average cumulative abnormal returns over 5 days following the announcement of purchases (sales)

[12] He uses a data set covering the largest 200 firms and assumes that insiders' transactions are announced (the Official Summary publishes an insider-trading event) two months after the event occurred.

[13] First, insider-trading information is available to investors through an online service or in the SEC reading room usually on the same day as the transaction was performed. This is the primary information dissemination concerning corporate insiders' trades. Shortly after, information about insider trading appears in the Wall Street Journal or other financial press. Finally, it is published in the SEC's *Official Summary of Securities Transactions and Holdings*.

by managers are 0.13 percent (-0.23 percent), whereas the transaction-day CAARs are 0.59 percent and 0.17 percent for purchases and sales, respectively. The differences in conclusions between Lakonishok and Lee (2001) versus Chang and Suk (1998) are substantial. First, it has to be noted that the *Insider Trading Spotlight* column in the Wall Street Journal (analyzed in Chang and Suk, 1998) covers only the larger transactions whereas the data set of Lakonishok and Lee (2001) is more comprehensive and covers all insider-trading transactions on the NYSE, Amex, and NASDAQ over the period from 1975 until 1995. Second, the differences in the conclusions by the two studies also result from differences in transaction size as larger transactions lead to stronger signals conveying more information. Moreover, it is possible that the Wall Street Journal publications are biased towards the more important and informationally richer transactions.

Examining the patterns of returns immediately around the trades of U.K. directors, Friederich et al. (2002) suggest that directors of less liquid and relatively smaller firms listed on the London Stock Exchange trade on price-sensitive information. For director purchases, abnormal returns turn positive on the transaction day and stay positive over the whole event window of 20 days following the net purchase. The cumulative abnormal returns are on average –2.85 percent over the pre-event period of 20 days, and 1.96 percent 20 days after the net purchase. The patterns are symmetrical for the directors' sales, though the magnitude of abnormal returns is lower. Directors typically sell shares after a run of positive price movements (1.23 percent over 20 days). Abnormal returns are predominantly negative after the directors' net sale, so that cumulative abnormal returns reach on average –1.46 percent. These findings are robust to different sensitivity checks concerning thin trading, outliers, variance changes, non-normality, and time dependence.

In summary, the empirical literature analyzing (short- and long-term) abnormal returns after insider trading documents that insiders indeed possess superior information regarding future prospects of their firms and market participants use this information to adjust prices accordingly. At the same time, however, many studies document that mimicking strategies net of transaction costs are not profitable.

2.4.3 Determinants of profitable insider trading

Some of the above mentioned empirical studies on profitability of insider trading explore also other firm and trade-related characteristics that may have impact on the CARs to insiders after their transactions. Firm size, intensity of trades (transaction size and number of insiders trading), and insiders' type are shown in some studies to influence the CARs.

It is more likely that insiders in small firms have a stronger informational advantage since small firms receive less attention from analysts (Jeng et al., 1999). This implies a negative correlation between information content of directors' dealings and firm size. Empirical results concerning this conjecture are mixed. Seyhun (1986) reports a significantly negative relationship and concludes that the most profitable insider trading occurs in small firms. However, more recent studies fail to support his finding (Lin and Howe, 1990 and Jeng et al., 1999). They argue that the Seyhun's (1986) finding is a result of size-related measurement error in abnormal returns. In other words, the relationship disappears ones abnormal returns are size-adjusted. So far, no empirical evidence has been provided on this relation between firm size and CARs following the announcement of insider trades for a U.K. sample. However, Gregory et al. (1997) report more insider-trading activity for less liquid and smaller stocks that may indicate higher information asymmetry and larger CARs for these firms.

Another notion is that insiders may be aware of the value of their informational advantage and trade more when they have more information (Seyhun, 1986). To put it differently: more intensive insider trading can be interpreted as a signal of higher information asymmetry. Lin and Howe (1990) propose two measures to assess the intensity of insider trading: number of insiders trading and the size of trades. Both the measures are expected to have a strengthening effect on the abnormal returns because the information content may be stronger for large trades and the information content is confirmed by multiple insiders' transactions. The empirical results are mixed, though Seyhun (1986) confirms the hypothesis: the market reaction to net insider transactions is significantly more positive for large trades (in terms of the (log-) value (in dollars) and the (log-) proportion of the firm traded). His results for the net number of trading insiders is,

however, not so clear-cut; it becomes insignificant after controlling for firm size.[14] Jeng et al. (1999) confirm Seyhun's results and show that medium-volume and high-volume insider purchases are more profitable compared to low-volume purchases[15]. In contrast, Lin and Howe (1990) show that neither number of insiders trading nor the dollar amount of insider trading are important determinants of insider's abnormal returns. For a U.K. sample of mid-cap firms, Friederich et al. (2002) report that clustered (repeated) buys and sells are associated with CAARs that are substantially higher than the full sample of insider buys and sells: CAARs 20 days after the clustered purchases are 4.5 percent compared to 1.9 percent for all purchases. For sales, the corresponding CAARs equal to –2.4 and –1.5 percent for the clustered and full sample, respectively. Furthermore, this study reports that medium-sized buys (between GBP 5,000 and 70,000) predict higher 20-day CAARs than large buys. Insider sales do not trigger a similar relationship.

The information hierarchy hypothesis postulates that directors who are familiar with the day-to-day operations of the company trade on more valuable information. Seyhun (1986) and Lin and Howe (1990) partially confirm this hypothesis using U.S. insider trading data.[16] The former study shows that cumulative abnormal returns after directors' dealings are significantly higher when 'officer-directors' trade compared to when 'officers' trade. Lin and Howe (1990) demonstrate that trades by chairmen, directors', officer-directors', and officers contain more information than those of large shareholders. In contrast, the results of Jeng et al. (1999) indicate that top executives' financial performance from share purchases in their own firm is lower (though not significantly) than that of officers or non-executive directors.[17] They propose two explanations. First, top executives are more carefully scrutinized by both market participants and regulators, and, consequently, they may be more reluctant to trade using their informational advantage. Second, trades by top executives are on average twice as large as those of

[14] Net number of insiders is defined as absolute value of the difference between number of buyers and sellers.
[15] The portfolios are decomposed according to the fraction of equity traded.
[16] Seyhun (1986) uses daily CARs from 1 to 50 (and 100) day following the insider-trading day. Lin and Howe (1990) use 6- and 12-month CARs.
[17] Results of Seyhun (1986) and Lin and Howe (1990) on the one hand and Jeng et al. (1999) on the other hand are not directly comparable as they use different methodology. The latter study uses a performance measure based on value-weighted portfolios comprised of all insider trades. All insider purchases (sales) are placed into a portfolio on the day that they are made and held in the portfolio exactly one year.

officers or directors, and larger transactions trigger stronger market price reactions. Therefore, the early results of Seyhun (1986) and Lin and Howe (1990) may be driven by transaction size.

2.4.4 Summary on market reaction to insider trades

To summarize, overall evidence for both U.S. and U.K. suggests that insiders do indeed possess superior information and by trading in the stock of their own companies earn positive abnormal profits over horizons from 6 to twelve months. However, many studies point out that outsiders mimicking insider trading would not earn abnormal profits since the positive and significant CARs diminish after accounting for transaction- or announcement delay and transactions costs for a round-trip transaction. Nevertheless, some evidence exists that large insider transactions may be more profitable and imply profitable mimicking strategies for outsiders. Evidence also suggests that the market adjusts prices significantly immediately after the announcements of these trades. The analysis of insider-trading characteristics indicates that large and clustered insider transactions may contain more information. Also, CARs following transactions by managers and officers are higher than CARs of other insiders.

2.5 Information content of aggregate insider trading

Another interesting hypothesis, put forward in Seyhun (1988), relates the insiders' information to the economy-wide factors. In particular, it is hypothesized that information-based trading by corporate insiders is both due to firm-specific information as well as industry-wide or economy-wide factors. If part of the insiders' information is due to the economy-wide factors, one should find a positive relation between aggregate insider-trading activity and subsequent market returns. For instance, insiders purchase stock of their own firm based on observation of mispricing partially caused by an increase of economy-wide activity which is unanticipated by the market. Subsequently, stock prices rise after market participants recognize the increase in economy-wide activity. This, however, implies that insiders' purchases appear to forecast the market rise. In general, the relation between the aggregate insider trading and market return does not require that

insiders are aware whether they trade on the basis of firm-specific or economy-wide factors. It is only necessary that insiders observe an unanticipated change in the cash flows of their firms and trade based on this information. In contrast, if insiders trade strictly on the basis of firm-specific information, insider trading and changes in economy-wide activity should not be related.

The findings of Seyhun (1988) support the hypothesis that insider trading forecasts changes in economy-wide returns: net aggregate insider trading activity[18] in a given month is significantly positively correlated with the return to the market portfolio during the subsequent two months. Furthermore, firm size and risk are positively associated with the insider ability to identify mispricing caused by economy-wide factors. Insiders in larger firms are more likely to observe and trade on the basis of economy-wide factors rather than firm-specific factors. Even though the evidence suggests that future market returns remain predictable (to some extent) after the publication of insider transactions, it cannot be used to obtain a profitable switching strategy between the Treasury bills and the stock market.

Seyhun (1992) further elaborates these findings and tests two competing hypotheses on the reasons behind this positive relation between aggregate insider transactions and future economy-wide returns. The first hypothesis (the cash flow hypothesis) postulates that changes in business conditions contribute to the forecasting ability of corporate insiders. In other words, if corporate insiders can predict the future cash flows in their own firms before other market participants and these changes are due to the economy-wide factors, insiders in all firms observe similar signals and trade in shares of their own firms in the same direction. An adjustment of stock prices of all firms will follow once the changes in economy-wide factors are recognized by other market participants. The competing hypothesis (the fads hypothesis) argues that the reason behind this relation is the fact that insiders can observe substantial deviations of prices from fundamentals in their own firms. If the mispricing is market-wide, then the aggregate insider trading will predict future market returns. In particular, when prices are in general too low relative to

[18] Net aggregate trading activity in a given month is defined as the sum across firms of standardized net number of transactions.

the fundamentals, insiders in aggregate will buy stock. Similarly, when the prices are too high, insiders in aggregate will sell the stock of their companies.

The result that current aggregate insider trading is positively related to future real activity[19] supports the cash flow hypothesis. However, simple predictive tests indicate that signals from aggregate insider trading can be used to predict negative future stock returns on portfolios of large number of firms. This casts doubt on the view that all predictive ability of aggregate insider trading can be attributed to business conditions only. Instead, aggregate insider trading also identifies periods when prices move away from fundamental values, which supports the fads hypothesis. In summary, the overall evidence suggests that both the changes in business conditions as well as movements away from fundamentals contribute to the information content of aggregate insider trading.

Lakonishok and Lee (2001) provide further evidence that insider activity seems to predict stock returns in excess of a simple contrarian strategy. When insiders are optimistic (they buy more than sell), markets on average do well and when they are pessimistic, markets do poorly, with an annual spread in returns exceeding 10 percent.

2.6 Timing of insider trades

Several empirical papers analyze the timing of insiders' trades relative to earnings announcements. Insiders with prior knowledge of earnings can identify the expected market reaction to the earnings announcement and strategically time their trades. For example, for an insider who is willing to sell some shares and has knowledge that his firm is about to announce unexpectedly high earnings it is optimal to delay the planned transaction until after the favourable announcement. His profit is higher if he postpones his sale until after the announcement since the announcement moves prices up. This is a passive trading strategy, similarly to insider purchases after unfavourable earnings announcements. Active trading strategies, on the other hand, represent insider trading before earnings announcements: purchases before announcements of good news and sales before announcements of bad news.

[19] Real activity is measured here by the growth rates of after-tax corporate profits, the index of industrial production, and the gross national product.

In the U.S., active insider trading is an explicit violation of the SEC's regulation. Nevertheless, insiders may still decide to trade using active strategies because they believe that detection or enforcement by the SEC is unlikely (Lustgarten and Mande, 1995). In contrast, purchases or sales delayed until after the announcement do not violate the law as the private knowledge of earnings that led insiders to delay trading no longer exists at the time of the transactions. Lustgarten and Mande (1995) document that insiders in the U.S. do time their transactions. Insiders decrease their purchases (measured by dollar value and number of shares transacted) after the announcement of good earnings news and increase them after announcement of bad news. The results for sales are not as straightforward. There is some weak evidence for passive timing of sales (more selling after favourable announcement). Still, insiders do not use their private knowledge of negative earnings announcement and do not sell their shares before the announcement of this unfavourable news: the dollar value and number of shares sold is lower before than after such announcement. The authors argue that this is due to the fact that sales may represent a consumption and diversification decision, whereas purchases reflect a portfolio decision to buy one security rather than another. Another explanation is that insiders are more likely to attract shareholder lawsuits after sales rather than purchases (Bettis et al., 2000). It seems that it is more acceptable for shareholders when managers profit on good news, but unacceptable when they profit on firm failure (Hu and Noe, 1997).

Bettis et al. (2000) document that in addition to the federal regulation, a large fraction of U.S. firms self-regulates insider trading of their directors and officers. In particular, in 1996, 78 percent of their sample firms had explicit blackout periods during which the company prohibits trading by its insiders. These restrictions have consequences on the timing strategies by insiders since they make active trading almost impossible. Insider-trading statistics provided in Bettis et al. (2000) confirm that insider-trading activity in the blackout period is less than one-third of that during allowed trading periods. This effect is more pronounced for sales than for purchases.

Insider-trading regulation is stricter in the U.K. In particular, insiders of firms listed on the London Stock Exchange are banned from trading for a period of two months prior to interim and final company earnings announcements. The trading ban implies that active trading strategies are more difficult to implement in the U.K. Thus, one may expect that

relative to the U.S. insiders, directors in the U.K. rely more on passive trading strategies. Hillier and Marshall (2002) document that the incidence of director trading is more than 400 percent larger in the 10-day period post earnings announcement than in the 10-day period prior to the trading ban. Moreover, approximately 23 percent of all trades by company directors take place within the 10-day period after the earnings announcement. The direction of insider trading goes in line with passive trading strategies: directors tend to buy after an unexpectedly poor earnings result and sell after a good earnings result. Although the timing of directors' trades is affected by the trading ban, the performance of their trades is not. In almost all periods, directors earn abnormal positive returns after buying while firms suffer abnormal negative returns after directors sell. Interestingly, Hillier and Marshall (2002) show that directors earn positive abnormal profits even when purchasing after an announcement of good news and selling after bad news is announced.[20]

In summary, the analysis of the relationship between earnings announcements and insider-trading strategies further confirms that insiders possess superior information and that they use this information to time their trades. Moreover, the evidence suggests that insiders rely more on passive trading strategies that do not violate insider-trading regulation.

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[20] In particular, CAARs over 120 days following the director trade were 16.07 and –12.36 percent after purchases and sales, respectively. Both are significant at 1 percent level.

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Chapter 3
Insider Trading and Corporate Control: Evidence from the U.K.*

3.1 Introduction

Under asymmetric information, insiders, defined as managers, and members of the board of directors of publicly traded corporations, possess more information about their company than small, dispersed shareholders. The informational advantage of insiders and its exploitation through insider trading raises many questions about the fairness and efficiency of financial markets (Leland, 1992). The importance of these questions is highlighted by Lakonishok and Lee (2001) who document that U.S. insiders trade frequently in the shares of their firm. Using a data set covering all the companies traded on the NYSE, Amex, and NASDAQ over the period from 1975 to 1995, the authors show that there is insider trading in more than 50 percent of the stocks in each year. On average, insider purchases (sales) per year amount to 0.6 percent (1.3 percent) of a company's market capitalization.

The major argument in favour of insider trading is that it is believed to convey new information about the firm's prospects to outsiders. Leland's (1992) model shows that when trading by insiders is allowed, share prices are higher and incorporate more

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information. Although, an insider purchase conveys positive information about the firm's prospects, it is less clear what information is conveyed by an insider sale. On one hand, an insider sale conveys bad information about the firm's prospects. On the other hand, an insider sale may be less informative given that the reason behind the sale may be a need for liquidity rather than bad news about the firm. Also, an insider may sell after the exercise of stock options which are part of his remuneration package. Such option-related sales of shares may therefore be less informative (Lakonishok and Lee, 2001).

The hypothesis that insiders possess superior information which is revealed to the market by directors' share transactions has been tested mostly on U.S. data. Many studies argue that given that insider trading earns abnormal returns, insiders hold superior information (see e.g. Seyhun, 1986, Lin and Howe, 1990, and Chang and Suk, 1998). In contrast, Lakonishok and Lee (2001) document a weak immediate market response to trading by managers and major shareholders of U.S. corporations listed on the NYSE, Amex, and NASDAQ. They argue that their findings suggest market underreaction to insider trading as insiders' trades become informative over longer investment horizons.

For the U.K., the early studies (King and Röell, 1988, Pope et al., 1990, Gregory et al., 1994, and Gregory et al., 1997) focus on determining long-term abnormal returns on directors' trades and confirm the existence of positive excess returns. Friederich et al. (2002) add to the existing research on the U.K. by examining the patterns of abnormal returns immediately around the trades of corporate insiders using daily data. They document positive abnormal stock price movements in the days after the directors buy and negative ones after the directors sell.

Contrary to the countries with a market-oriented corporate governance system, there is little empirical evidence on insider trading in continental Europe. This may be due to a lack of data caused by lax regulation on the disclosure of insider trades. Eckbo and Smith (1998), one of the few exceptions, analyzes the long-term performance of insider trades on the Oslo Stock Exchange. Still, some studies do not analyze the profitability of insider trades directly but rather concentrate on, for example, the effect of insider-trading regulation on stock market characteristics (Kabir and Vermaelen, 1996).

The definition of insider trading frequently causes confusion. We adopt the legal U.K. definition. Inside information is, according to the Misuse of Information Act, information

that is "material, current, reliable and not available to the market" and is legally qualified as "new and fresh". In the Criminal Justice Act trading on insider information (information not regularly available and obtained through insiders) is a legal offence and can be prosecuted. Our paper will not deal with illegal trading on insider information, but will focus on directors' dealings, the legal trading by directors of the company as defined in the listing rules of the London Stock Exchange (Source Book August 2002, Chapter 16). Whereas in the U.K. there is a distinction between illegal and legal directors' dealings, the U.S. regulation does not make such a distinction. We also adopt the U.K. definition of a director. In the U.K., the term director covers both the non-executive and executives. Conversely, in the U.S., executives are normally referred to as officers and non-executives as directors.

In this study, we analyze the immediate market reaction to directors' transactions for companies listed on the London Stock Exchange during 1991 to 1998. Our results support previous findings that directors' trades convey new information on the firm's prospects. The main contribution of this study, however, is the analysis of the impact of corporate control on the information content of directors' dealings. To our best knowledge, no previous study has explored this relationship so far. In particular, we analyze the impact of presence of different blockholder categories on the cumulative abnormal returns (CARs) immediately after the announcement of directors' transactions. We argue that the market takes into account all available public information – including the firm's corporate control characteristics – when reacting to the information embedded in the insider transactions. For example, directors' dealings may have relatively less informational value for firms owned by outside blockholders who monitor than for firms with dispersed ownership which may suffer from a higher asymmetry of information.

Our results confirm that market participants consider the firm's control structure when reacting to directors' trades. In general, the market reaction differs depending on the degree of outsider and directors' ownership, as well as the degree of institutional and other outsider ownership. Corporations and individuals or families unrelated to the management reduce the CARs indicating that monitoring by these blockholders leads to lower informational asymmetry. In contrast, institutional investors trigger higher CARs. This result confirms the findings by Franks at al. (2001) and Faccio and Lasfer (2002) who

conclude that institutional investors in the U.K. are passive investors. These institutions seem to trade on public corporate information (including announcements of directors' trades) rather than on inside information. Finally, our results confirm that markets perceive directors' entrenchment and accountability as an important factor when reacting to directors' transactions. For firms with significant directors' stakes, the positive news contained in directors' purchases is mitigated by the danger that directors become more entrenched and hence less accountable. Similarly, the market reacts less negatively when directors with significant stakes sell (part of) their shares as this reduces their entrenchment.

In situations of high uncertainty, i.e. when the firm performs poorly or is close to financial distress, we find stronger market reactions to directors' dealings. In such cases, the positive (negative) signal of directors' purchases (sales) is important irrespective of the shareholder structure.

We fail to find support for the information hierarchy hypothesis (Seyhun, 1986). Although CEOs are assumed to have the best knowledge about their company's prospects, the information content of CEO trades is lower than that of other director categories. Moreover, we report that when former directors (who left the firm within the financial year preceding the transaction) purchase shares, the market reaction at the announcement of these trades is larger than that associated with the purchases by other categories of directors. Conversely, the market does not react to sales transactions by former directors as such trading may be related to personal wealth diversification or liquidity needs.

The remainder of the paper is organized as follows. The next section reviews the existent literature and develops hypotheses. Section 3.3 describes the data sets while the event study methodology is explained in Section 3.4. Section 3.5 discusses the results and Section 3.6 concludes.

3.2 Research hypotheses

Several empirical studies on insider trading confirm that insiders possess superior information relating to the future prospects of their firms (Jaffe, 1974, Seyhun, 1986, Lakonishok and Lee, 2001). Usually, two approaches are employed to measure the effect

of insider information. First, if insiders possess superior information, they can trade on this information in order to realize abnormal returns. The fact that insiders achieve significant abnormal profits over the 6 to 12 months following their transactions in the stock of their own firm is interpreted as proof of their superior information (see, for example, Jaffe, 1974, Rozeff and Zaman, 1988, Lin and Howe, 1990, and Gregory et al., 1997). Second, in (reasonably) efficient stock markets, insider trading may trigger a prompt adjustment of share prices when outsiders revise their expectations about the firm's future value. Thus, the information content of insider trades as perceived by the market can be captured by the immediate market reaction – abnormal returns on the date of publication of the information on the insider trades (Jaffe, 1974, Chang and Suk, 1998, Lakonishok and Lee, 2001, and Friederich et al., 2002).[21]

In this study, we focus to investigate how the abnormal returns to directors' dealings around the announcement day relate to specific corporate control characteristics of the firms. However, first, we test the previously confirmed hypothesis of whether directors possess superior information about the future value of their firm (or at least, whether the market believes that the directors trade on superior information).

By purchasing their firm's shares, directors send a positive signal concerning the future value of the firm to the market. The signal is costly as the directors, being maximizers of their personal wealth, put their own wealth at stake. At the same time, they increase risk of their not optimally diversified portfolio as they invest a relatively large fraction of their personal wealth to one firm. Hence, insider trades are credible signals to outsiders.

Hypothesis 1a: The market reaction to the announcement of directors' purchases is positive.

Conversely, directors emit a negative signal when selling shares. Nevertheless, this signal may be less informative than the signal related to purchases as directors may be wealth constrained and sales may therefore be motivated by liquidity needs (Lakonishok and Lee, 2001 and Friederich et al., 2002). Also, they may sell because of diversification

[21] For a more detailed literature survey see the previous chapter.

reasons. The directors in this study do not only own considerable shareholdings in their firm, but the company also provides most of their other sources of income (salary, bonus and possibly stock options).

Hypothesis 1b: The market reaction to the announcement of directors' sales is negative.

Hypothesis 1c: The absolute value of the market reaction associated with directors' sales is smaller than that associated with purchases.

These hypotheses postulate that directors' trades serve as signals that convey new information to the market and decrease the level of information asymmetry. The higher the announcement reactions to directors' trading, the higher the (ex ante) information asymmetry between outsiders and directors (Khang and King, 2002).

Next, we relate the degree of information asymmetry (as measured by the market announcement reaction) to specific corporate control characteristics. We first test the information hierarchy hypothesis, which postulates that the information content of the transactions depends on the category of the trading director (Seyhun, 1986). Second, we relate information asymmetry to control structures.

The information hierarchy hypothesis postulates that directors who are familiar with the day-to-day operations of the company trade on more valuable information. Seyhun (1986) and Lin and Howe (1990) partially confirm this hypothesis on U.S. data.[22] The former study shows that cumulative abnormal returns after insider trading are significantly higher when 'officer-directors' trade compared to when 'officers' trade. Lin and Howe (1990) demonstrate that trades by chairmen, directors, officer-directors, and officers contain more information than large shareholders. In contrast, the results of Jeng et al. (1999) indicate that top executives' financial performance from share purchases in their own firm is lower (though not significantly) than that of officers or non-executive directors.[23] They propose two explanations. First, top executives are more carefully

[22] Seyhun (1986) uses daily CARs from 1 to 50 (and 100) day following the insider-trading day. Lin and Howe (1990) use 6- and 12-month CARs.

[23] Results of Seyhun (1986) and Lin and Howe (1990) on the one hand and Jeng et al. (1999) on the other hand are not directly comparable as they use different methodology. The latter study uses a performance measure based on value-weighted portfolios comprised of all insider trades. All insider purchases (sales) are placed into a portfolio on the day that they are made and held in the portfolio exactly one year.

scrutinized by both market participants and regulators, and consequently, top executives may be more reluctant to trade on any informational advantage. Second, trades by top executives are on average twice as large as those by officers or directors, and larger transactions trigger stronger market price reactions. Thus, the early results of Seyhun (1986) and Lin and Howe (1990) may be driven by transaction size.[24]

According to the information hierarchy hypothesis, executive directors should have a stronger informational advantage than non-executives. Former directors who left the firm within the financial year preceding the transaction trigger stronger announcement returns when they purchase additional shares than incumbent directors. The reason is that former directors may still possess some superior information but can trade more freely on that information. In turn, when former directors sell their shareholdings, the market may not react as the severed employment/governance tie with the firm may mean that they sell because of liquidity needs and not because of negative information.

Hypothesis 2: *The abnormal returns associated with directors' purchases and sales depend on the type of director. These returns – positive following directors' purchases of shares and negative following directors' sales – decrease in absolute value with the category of director in the following order: chief executive officer, other executive directors, non-executive chairman, non-executive directors. When former directors buy shares this causes strong positive announcement returns.*

Agency theory predicts that large blockholders reduce agency costs provided they are good monitors (Maug, 1998, Admati et al., 1994). Blockholders are expected to oversee firm activities and ensure that managers act in the interest of shareholders. This means that the monitoring activities of concentrated owners create value by forcing the managers to spend less on perks and to focus more on firm value. In line with this monitoring effect, we conjecture that directors' dealings contain less information for the market when there is strong concentrated outsider ownership. When outsiders monitor the firm, directors enjoy fewer private benefits of control and are more likely to make decisions in line with shareholder value maximization. As intensive monitoring may lead to better managed firms, market participants derive less information from directors' transactions. Thus, we

[24] We are not aware of any U.K. evidence on the subject.

conclude that the announcement effect of directors' dealings is smaller in the presence of strong outside blockholders.

Holderness and Sheehan (1988) show that the nature of corporate control is important. Usually, empirical studies distinguish between three categories of outside blockholders: corporations, financial institutions, and individuals or families not related to the management. For the case of the U.K., financial institutions, such as banks, mutual and pension funds, and insurance companies, are deemed not to be active monitors (Franks et al., 2001). In 1999, the government set up the Newbold Commission, which was to make some propositions to encourage institutions to exercise voting rights (Stapledon and Bates, 2002). Institutions do not usually have the resources to monitor the (many) firms in their investment portfolios. Monitoring may provide the institutions with inside information. Consequently, due to insider trading restrictions their portfolio investments may be locked in. Therefore, financial institutions may refrain from active monitoring. Thus, we conjecture that the monitoring effect holds only for outsiders such as corporations, and individuals or families unrelated to management.

The fact that financial institutions do not monitor gives them the opportunity to trade on signals (they do not possess inside information that triggers the regulation on trading). Thus, financial institutions may follow directors' dealings and rebalance their portfolios accordingly. If financial institutions rely on information released by the directors or on (costly) signals emitted by the directors (such as their dealings) and act (trade) upon this information, the positive signal of directors' purchases may even be strengthened.[25]

In summary, we postulate two hypotheses regarding the impact of active blockholders on the information content of directors' trading:

Hypothesis 3 (monitoring effect by active outside blockholders): The announcement effect of directors' purchases and sales is weakened by the presence of a monitoring outside blockholder (corporations and individuals or families unrelated to the directors).

[25] Thus, we conjecture that institutional investors are not monitoring the firms in their portfolio – they are passive in their corporate governance roles. Still, we consider institutional investors to be active in rebalancing their portfolio and buying and selling on publicly available information.

Hypothesis 4 (liquidity trading by institutions): The announcement effect of directors' purchases and sales is stronger in the presence of an institutional blockholder.

Directors do not only have direct access to restricted corporate information but also have different incentives than major outside blockholders (Holderness and Sheehan, 1988). For directors, the financial performance of their equity stake in the firm may be of secondary importance if they can derive private benefits of control from their position within the firm. These private benefits are not transferable but are investor specific: they may be a salary, perquisites (e.g. company car), prestige or reputation, or value expropriated from minority blockholders (Johnson et al., 2000).

At lower levels, directors' ownership is believed to align the managerial incentives with those of other shareholders (Jensen and Meckling, 1976). It complements other corporate governance mechanisms such as product market competition, the managerial labour market, the board of directors, and the market for corporate control (Morck et al., 1988, Berger et al., 1997). When directors' ownership stakes increase to high levels, however, directors may become entrenched, they may be able to resist many disciplining actions. Consequently, the market may react negatively to the announcement of a substantial increase in directors' shareholdings which may insulate directors from outsider monitoring. This negative effect may even dominate the positive signal of directors' purchases. Similarly, the negative effect of directors' selling share stakes may be greeted positively for those firms with director entrenchment. Morck et al. (1988) show that the effect of increased entrenchment is the strongest for insider ownership between 5 percent and 25 percent in the U.S.[26]

Hypothesis 5a (entrenchment effect): The positive (negative) announcement effect of directors' purchases (sales) is weaker if control by directors is already strong as the purchases (sales) potentially increase (decrease) directors' entrenchment.

[26] But they also argue that managerial ownership above 25 percent does not entail a further entrenchment penalty.

The information effect of directors' purchases and sales should also depend on the distribution of voting power within the firm. A high concentration of director ownership may create less of an entrenchment problem provided it faces strong outsiders. Strong outsiders may prevent directors from making decisions that do not maximise firm value. Therefore, the entrenchment effect formulated in Hypothesis 6a may not apply – or apply to a lesser extent – to firms in which directors' voting power is balanced by the presence of strong outsiders. This means that the positive signal of purchases and the negative signal of sales are stronger when directors own large stakes in the presence of corporations and individuals or families unrelated to the management than when directors' ownership is high or in the presence of institutional ownership.

Hypothesis 5b (blockholder power structure): When directors own large stakes in the presence of share blocks held by corporations and individuals or families unrelated to the directors, the market is less concerned about directors' entrenchment. This leads to a stronger positive signal of purchases and a stronger negative signal of sales.

Under high uncertainty, the market is expected to react more strongly to the release of new information. Therefore, we expect the CARs associated with the announcement of directors' transactions in poorly performing or financially distressed firms to be higher than in well performing firms. Furthermore, Franks et al. (2001) show that the monitoring behaviour of blockholders depends largely on corporate performance. In particular, they document that blockholders discipline underperforming management in periods of poor performance and/or financial distress. Consequently, when directors purchase shares in poorly performing companies, stronger positive price reactions can be expected for (i) firms with outside blockholders and (ii) firms whose directors already own a substantial share stake. In the former group of firms, the presence of outside blockholders may increase the likelihood of a restructuring process (Franks and Nyborg, 1996). In the latter group of firms, directors are risking marginally more of their own wealth while they have already committed a substantial part of their wealth to the firm. This positive signal may more than cancel out the negative effect of entrenchment.

If the directors of poorly performing or financially distressed firms sell (part of) their stakes this may reflect their pessimistic expectations about the firm's progress. The CARs

associated with the announcement of such transactions are expected to be strongly negative irrespective of the ownership structure.

Hypothesis 6 (performance effect): In poorly performing companies, directors' purchases and sales convey more information to the market and trigger stronger announcement reactions than in well performing firms.

Hypothesis 7 (performance and blockholders): Directors' purchases in poorly performing companies with outside blockholders or strong directors' ownership trigger stronger positive price reactions as the presence of blockholders may facilitate corporate restructuring.

3.3 Data sources and descriptive statistics

We use a comprehensive database which covers: (1) directors' dealings data, (2) ownership data, (3) daily return data, (4) London Share Price Data (LSPD) comprising company specific information (like capital structure changes, number of shares outstanding and industry specification), and (5) accounting data. The data description follows.

3.3.1 Directors' dealings.

Data on directors' dealings cover the transactions of directors in all U.K. listed companies over the period of 1991 to 1998. The data set was acquired from Hemmington Scott, now BARRA Global Estimates. The original file contains 58,363 entries and includes information on: company name, director's name, director's holdings, transaction and announcement date, number of shares traded, price, security type (90 different types),[27] transaction type (11 different types),[28] and each director's board position. After matching all the transactions with specific companies (by assigning SEDOL numbers), we excluded financial firms. Subsequently, we collected the number of shares outstanding for

[27] The 90 security types include, for example, ordinary shares, restricted voting shares, options, warrants, convertibles. The full list of security types is available on request.
[28] Transaction types are buy, sell, exercise, options granted, sale post exercise, take up, scrip dividend, inherited, bed & breakfast, gift given, gift recorded, and scrip issue.

each firm at the time of the transaction in order to calculate the relative size of the transaction.

The many duplicate entries and some inaccurate reporting of transactions reduced the number of observations by roughly 40 percent. The data cleaning process consisted of three steps: first, if a director is trading the same number of shares within the same day (e.g. two sales of 1,313 shares; or two purchases of 1,313 shares), we only retain one of these transactions. Second, we summed up multiple sales (or purchases) by the same director during a given day (e.g. one sale of 10,000 shares and another one of 5,000 shares are added up one sale of 15,000 shares). Third, when a director purchases and sells shares on the same day, we netted those transactions (e.g. a purchase of 10,000 shares and a sale of 5,000 shares results in a net purchase of 5,000 shares). Following all these adjustments, we are left with a sample of 35,439 transactions for 1,498 firms.

We rearranged the 90 security types into 9 groups: (1) ordinary voting shares, (2) non-voting shares, (3) options on voting shares, (4) options on non-voting shares, (5) convertible debt, (6) convertible preferred shares, (7) rights, (8) warrants, and (9) others. For the non-financial firms in our sample, Appendix 1 contains the basic statistics for these 9 security type groups. The most frequently occurring transactions are on ordinary voting shares and the exercising of options: 27,416 trades (78 percent of all reported directors' transactions) and 5,885 transactions (17 percent), respectively. In Appendix 2, we show descriptive statistics per transaction types for the most frequently traded security types: ordinary voting shares, share options and rights. Appendix 3 shows the distribution of the relative size of each type of transaction. Most of the transactions are relatively small: as many as 83 percent of all purchase transactions of ordinary voting shares (12,019 out of 14,500) involve less than 0.1 percent of the company's shares. The biggest purchase transaction of the database relates to 41 percent of the share capital outstanding. The average sale transactions are somewhat bigger than the purchase transactions. Only 61 percent of them (4,101 out of a total of 6,769 transactions) involve less than 0.1 percent of a firm's shares. In this study, we analyze the transactions with respect to their relative size (as a percentage of shares outstanding) rather than to their transactional value (in GBP). The reason is that one of the focal points of this paper is relative voting power and changes in control. The average (median) purchase transaction by directors amounts to

GBP 63,626 (14,616) while the average (median) sales transaction is larger with GBP 107,433 (31,908).

The summary statistics of directors' trades in the U.K., as presented in Panel A of Appendix 4, are directly comparable with those from Lakonishok and Lee (2001) on U.S. data. It seems that directors of U.K. firms are less active in trading the shares of their own firms. Even though, the fraction of firms with at least one directors' share transaction per year is almost the same for the two markets, directors in the U.K. make fewer transactions: 1.49 (1.09) purchase (sale) transactions per listed U.K. firm in each year versus 2.77 (4.74) purchase (sale) transactions per firm-year in the U.S. Also, U.K. directors on average purchase (sell) 0.2 percent (0.5 percent) of their company's market capitalization per year, while American managers purchase (sell) 0.6 percent (1.3 percent) of their company's market capitalization. The differences between U.K. and U.S. directors' dealings are particularly pronounced for sales. This results from the fact that American managers are awarded more stock options than their British counterparts (Conyon and Murphy, 1999). Moreover, the London Stock Exchange (LSE) regulation is stricter than U.S. regulation (Friederich et al., 2002). For example, directors of firms listed on the LSE are prohibited from trading for two months prior to an earnings announcement and one month prior to a quarterly earnings announcement. Furthermore, outside those periods, these directors are required to receive clearance before they can trade from the chairman of the board of directors. In general, there is no such regulation in the U.S. Lustgarden and Mande (1995) show that in their sample of U.S. firms the volume of insider trading declines as an earning announcement approaches but does not decline to zero. Nevertheless, Bettis et al. (2000) document that besides the federal regulation, a large fraction of U.S. firms impose additional insider-trading restrictions on their directors and officers that resembles the U.K. regulation.[29]

The evolution of directors' dealings between 1991 and 1998 in the U.K. is documented in Panel B of Appendix 4. Directors' trading (measured as the total number of shares traded per firm-year) increased throughout the beginning of the period, peaked in 1996, and decreased thereafter. However, the average fraction of shares traded by the entire

[29] Bettis et al. (2000) report that as much as 78 percent of firms in their sample had explicit blackout periods during which the company prohibits trading by its insiders.

board per year (as percent of the market capitalization) remained rather stable over the period. During the period, directors sell two to three times more shares than they buy. However, U.S. managers have even higher sales to purchase ratios (an average of seven sales to one purchase per year). Moreover, the value of their sell transactions is growing constantly since the mid 1970s.

3.3.2 Ownership data.

Information on ownership structure over the period of 1991-1998 was obtained from the Worldscope database. The database records all direct ownership stakes of 5 percent or more of the ordinary shares outstanding. We classify these stakes into several categories according to who owns them: directors, industrial and commercial corporations, the government, financial institutions, and individuals or families. Further, financial institutions were subdivided into banks, investment/pension funds, insurance companies, and real estate firms. As the database does not report whether an individual is a director, we used the Stock Exchange Yearbook for every individual reported in the database (around 7.400 persons) to check whether he or she is one of the following (i) CEO, (ii) executive chairman (iii) person combining the positions of CEO and chairman, (iv) other executive directors, (v) non-executive chairman, (vi) other non-executive directors, and (vii) individuals and family members who are not directors or related to a director.

Appendix 5A reports the summary statistics for all the share stakes of at least 5 percent for 1992-98. In panels A, B, and C, we record the stake of the largest shareholder, the sum of all disclosed shareholdings, and the Herfindahl index of all ownership stakes, respectively. The largest shareholder controls on average 21 percent (with a median of 16 percent). It should be noted that the ownership structure is stable throughout the whole sample period. If all blockholders were to form a coalition, they would control almost 40 percent of the voting rights. The Herfindahl index confirms that control is not concentrated in the hands of one or two blockholders. In fact, there are about 6 blockholders in the average U.K. firm.

Appendix 5B contains a detailed analysis of ownership by category of owner. Institutions are clearly the most frequent shareholder category: they are present in most U.K. firms but their individual stakes usually do not exceed 10 percent. Corporations

control the largest equity stake in only 10 percent of listed U.K. firms, but their shareholdings are large (about 30 percent). Likewise, families and individuals (not related to a director) own share stakes in a minority of sample firms but usually hold large share stakes. Since the privatizations of the late 1980s, the government rarely holds equity stakes in listed companies. Directors – the CEO, the chairman, executive and non-executive directors – form another important shareholder category. Their large equity stake is partly explained by the fact that yearly a large number of firms are newly admitted on the stock exchange.[30] At flotation, the initial shareholders (usually the firm's managers) retain a relatively large share stake which they gradually dilute over time (Goergen and Renneboog, 2003).

3.3.3 LSPD database

The LSPD database is offered by the London Business School**.** The Master Index File contains data about approximately 6,700 companies, with a complete history for all U.K. companies quoted on the LSE since 1955. It contains among others the SEDOL number, birth date, death date, company name, reason for birth, and reason for death. This database allowed us to trace SEDOL numbers, and changes in company names. Data concerning the number of shares outstanding for each firm-year and the industry code were collected and then matched with the directors' dealings file.

3.3.4 Datastream data.

Adjusted daily prices and dividends for all companies over the period since January 1990 until December 1998 were obtained from Datastream. We also used the database to obtain basic accounting control variables concerning, for example, profitability, market capitalization, indebtedness, and market-to-book ratio.

[30] Newly floated firms account for around 4 percent of all listed companies on a yearly basis measured over two decades.

3.3.5 The combined sample of directors' transactions

Our hypotheses focus on directors' purchase and sale transactions in ordinary voting shares. As the information content of small dealings is small (as shown by previous empirical investigations (amongst others e.g. Seyhun, 1986 and Bettis et al., 1997), we focus on large transactions involving at least 0.1 percent of company's shares outstanding.[31] Summary statistics of these transactions matched with daily returns, ownership and accounting data are reported in Table 3.1. Each observation represents an event (a firm-day with an directors' purchase or sale) and is retained when the net purchase (sale) on that day is at least 0.1 percent of the corporate market capitalization. A net purchase (sale) is defined as the total number of shares purchased (sold) on the given day by all directors minus the total number of shares sold (purchased) on the same day. In general, since we deal with daily data, only a small fraction (around 4 percent) of all firm-day observations in our sample needed to be netted.

On average, directors' purchases are smaller than sales (Panel A). The median net value purchased by directors is £36,000 (representing 0.27 percent of the average market capitalization) compared to £147,155 (0.48 percent) sold. In terms of the distribution of transactions among the different categories of directors, CEOs and chairmen are the most active. In particular, they are involved in 581 and 492 (490 and 350) purchases (sales), respectively. Former directors (dismissed or retired within the previous fiscal year) are also very actively selling their holdings. However, their purchases – both in number and size of the trades – are surprisingly similar to those of the incumbent directors. Over the period of 1991-98, former directors made almost 400 purchases each representing at least 0.1 percent of their firm's market capitalization. The median purchase transaction by a former director amounts to 0.31 percent of company's shares, which is comparable in size to the transactions by other director categories.

[31] Appendix 6 provides a useful overview of the process of data cleaning that resulted in the final sample.

TABLE 3.1: SUMMARY STATISTICS

This table reports the summary statistics for all reported purchases and sales of U.K. directors over the period since 1991 till 1998 that represent at least 0.1 percent of company's market capitalization. *'Trade value'* is defined as total number of shares transacted by directors of given company on the corresponding day times price per share at the beginning of the calendar year. *'% market capitalization'* stands for the ratio of net number of shares transacted over number of shares outstanding at the beginning of the year. *'Interest coverage'* is computed as earnings before interests and taxes over total interest expenses. *'CEO'* represents reported dealings of chief executive directors and managing directors. *'Executive'* covers dealings of chief executive directors and managing directors, deputy chief executive directors, deputy managing directors, and financial directors. *'Chairman'* corresponds to the dealings of chairmen of the board. *'Other incumbent directors'* represents dealings of all incumbent directors that are not executive, chairmen or deputy chairmen. *'Former directors'* includes dealings of retired, dismissed or deceased directors. *'Book-to-market ratio'* is defined as book value of equity over market capitalization. *'Debt-equity ratio'* is computed as book value of long-term debt to book value of equity. *'Interest coverage'* is defined as earnings before interest and taxes over total interest expenses.

Panel A: Transaction size	**# of obs.**	**Mean**	**Std. Dev.**	**Min**	**Max**	**p25%**	**Median**	**p75%**
PURCHASE TRANSACTIONS								
trade value	1861	1,075,571	36,500,000	19	1,590m	12,800	36,000	116,030
% market capitalization		0.96%	3.61%	0.10%	77.45%	0.15%	0.27%	0.58%
% market cap. by category of director								
CEOs	582	1.04%	3.92%	0.10%	77.45%	0.18%	0.31%	0.67%
other top executives	112	1.29%	4.44%	0.10%	44.29%	0.17%	0.28%	0.95%
chairmen	492	1.30%	4.07%	0.10%	52.27%	0.19%	0.36%	0.78%
other incumbent directors	606	1.34%	5.33%	0.10%	77.45%	0.15%	0.29%	0.64%
former directors	396	1.51%	6.00%	0.10%	77.45%	0.14%	0.31%	0.81%
SALE TRANSACTIONS								
trade value	2004	890,679	3,881,658	32	79,700m	37,087	147,155	577,760
% market capitalization		1.38%	2.74%	0.10%	39.05%	0.21%	0.48%	1.28%
% market cap. by category of director								
CEOs	490	1.85%	2.73%	0.10%	18.47%	0.35%	0.82%	1.95%
other top executives	115	1.58%	2.70%	0.11%	14.43%	0.20%	0.54%	1.44%
chairmen	350	2.07%	3.94%	0.10%	39.05%	0.32%	0.69%	2.03%
other incumbent directors	766	1.29%	2.60%	0.10%	39.05%	0.20%	0.46%	1.22%
former directors	626	1.55%	2.95%	0.10%	23.62%	0.20%	0.51%	1.36%
Panel B: Accounting variables	**# of firms**	**Mean**	**Std. Dev.**	**Min**	**Max**	**p25%**	**Median**	**p75%**
PURCHASE PORTFOLIO								
market capitalization (in million)	551	78	434	0	8,066	7	18	42
number of employees		1,139	3,587	3	62,943	197	431	986
earnings after taxes (in thousands)		1,285	12,435	-93,300	204,300	-142	602	2,221
return on equity		3.99	156.53	-1,859.68	1,944.62	-2.46	8.52	17.41
book-to-market ratio		0.94	1.11	-7.45	10.25	0.36	0.71	1.24
debt-equity ratio		0.41	0.80	-4.89	8.22	0.08	0.24	0.50
interest coverage		71.65	582.19	-992.50	10,777.00	0.61	3.44	9.98
SALE PORTFOLIO								
market capitalization (in million)	628	133	297	0	4,010	18	47	142
number of employees		2,089	6,857	5	93,497	230	551	1,426
earnings after taxes (in thousands)		5,935	18,081	-197,200	177,500	622	2,395	6,200
return on equity		-0.95	353.22	-6,775.32	720.68	8.14	15.68	27.41
book-to-market ratio		0.57	0.69	-3.58	7.96	0.24	0.42	0.71
debt-equity ratio		0.09	3.96	-97.53	13.46	0.04	0.16	0.34
interest coverage		73.46	444.33	-3,878.67	6,204.99	3.54	8.87	23.50

Table 3.1 continued

Panel C: Ownership structure	# of firms	%	Mean	Std.dev.	Min	Max	p25%	Median	p75%
PURCHASE PORTFOLIO									
total stake to:									
all reported shareholders	551		28.5%	24.5%	0.0%	97.0%	0.0%	29.1%	49.0%
all outsiders together			18.2%	18.7%	0.0%	97.0%	0.0%	14.7%	30.0%
corporations			2.6%	8.1%	0.0%	76.3%	0.0%	0.0%	0.0%
fin. institution			13.4%	15.8%	0.0%	81.8%	0.0%	7.3%	23.5%
individual outsiders			2.2%	5.0%	0.0%	34.2%	0.0%	0.0%	0.0%
all directors together			10.3%	17.6%	0.0%	77.6%	0.0%	0.0%	14.0%
conditional total stake to:									
all reported shareholders	378	69%	41.6%	18.2%	2.6%	97.0%	28.3%	40.9%	54.4%
all outsiders together	356	65%	28.2%	16.2%	2.0%	97.0%	16.8%	26.0%	37.4%
corporations	98	18%	14.5%	14.2%	1.5%	76.3%	5.0%	8.7%	19.8%
fin. institution	328	60%	22.6%	14.7%	2.0%	81.8%	11.2%	19.8%	31.6%
individual outsiders	130	24%	9.2%	6.6%	1.1%	34.2%	5.0%	7.5%	11.5%
all directors together	230	42%	24.8%	19.7%	1.0%	77.6%	8.2%	18.2%	38.2%
SALE PORTFOLIO									
total stake to:									
all reported shareholders	628		23.0%	22.5%	0.0%	89.0%	0.0%	18.6%	39.0%
all outsiders together			13.7%	15.5%	0.0%	65.6%	0.0%	9.2%	22.6%
corporations			1.9%	6.7%	0.0%	50.0%	0.0%	0.0%	0.0%
fin. institution			10.2%	12.7%	0.0%	62.3%	0.0%	5.2%	17.3%
individual outsiders			1.6%	4.9%	0.0%	34.7%	0.0%	0.0%	0.0%
all directors together			9.2%	16.3%	0.0%	88.0%	0.0%	0.0%	11.3%
conditional total stake to:									
all reported shareholders	417	66%	34.5%	19.0%	2.0%	89.0%	18.6%	32.2%	47.2%
all outsiders together	391	62%	22.0%	14.2%	1.1%	65.6%	11.4%	18.6%	29.7%
corporations	87	14%	13.6%	12.8%	0.9%	50.0%	3.8%	8.5%	19.9%
fin. institution	351	56%	18.2%	11.9%	1.1%	62.3%	9.1%	16.4%	25.3%
individual outsiders	102	16%	10.0%	8.0%	0.9%	34.7%	4.6%	7.0%	13.6%
all directors together	252	40%	23.0%	18.7%	1.1%	88.0%	7.9%	16.5%	33.2%

Panel B shows that directors sell rather than purchase shares in firms that are bigger, more profitable, have less debt and have lower book-to-market ratios. According to Friederich et al. (2002), directors purchase stock when they believe the stock is undervalued (as measured by a high book-to-market ratio) and has performed rather poorly in the recent past. We also find that directors sell when their firms are overvalued (as suggested by low book-to-market ratio) and perform relatively well.

Panel C of the table shows ownership structure for firms whose directors buy shares and those whose directors sell shares, respectively. Firms whose directors sell shares have usually less concentrated ownership. On average, the blockholders hold jointly 28.5

percent of the ordinary shares in firms whose directors purchase additional shares versus only 23 percent in firms whose directors sell.[32] Financial institutions own shares in the majority of firms (in 60 and 56 percent of firms for the purchase and sale portfolio, respectively) but their ownership stakes tend to be quite low. On average they hold 13 percent (10 percent) of shares outstanding in firms with net purchases (sales).[33] Directors are the largest shareholders. In those firms in which they own a stake, they own on average around 25 (23) percent for firms with net directors' purchases (net sales). Individuals or families unrelated to the management hold in total only around 9 and 10 percent for firms with net purchases and sales, respectively, compared to 15 and 14 percent, respectively, held by corporations.

3.4 Methodology

In this section, we present definitions of the abnormal returns (CARs and CAARs) that capture the announcement effects of directors' transactions. We also describe the (parametric and non-parametric) statistics used to verify statistical significance.

3.4.1 Event study methodology

3.4.1.1 Basic models

In this chapter, we study the information content of directors' dealings by analyzing short-term share price reactions. We calculate abnormal returns at the announcement using the event study methodology.

Daily returns are defined as follows:

$$R_{i,t} = \frac{nP_{i,t} + D_{i,t} - P_{i,t-1}}{P_{i,t-1}}, \qquad (1)$$

[32] The conditional statistics (based on the cases in which a blockholder of specific category is present) confirm the picture. The average ownership concentration in firms that have at least one blockholder is 42 percent in the purchase portfolio and 35 percent in the sale portfolio.

[33] When calculating the average over the firms in which institutional owners hold at least a 5-percent ownership stake, the average combined aggregated institutional stake amounts to 23 percent in companies whose directors purchase shares and 18 percent in companies whose directors sell.

where *i* and *t* denote security and day, respectively. *P* and *D* are adjusted daily prices and dividends downloaded from Datastream and *n* stands for the number of new shares for each old share in case of a stock split. We compute the abnormal returns (AR) using the market model. The abnormal return $AR_{i,t}$ for security *i* on day *t*, for each day from the 20th day before to 20th day after each event day is defined as follows:

$$AR_{i,t} = R_{i,t} - \left(\hat{\alpha}_i + \hat{\beta}_i R_{m,t}\right) \qquad \text{for } t = -20,...,20, \tag{2}$$

where $R_{i,t}$ is the return on security *i* on day *t* defined as in (1), and $R_{m,t}$ is the market return on day *t* proxied by the FTSE All Share index excluding investment trusts that is downloaded from the Datastream. The parameters $\hat{\alpha}_i$ and $\hat{\beta}_i$ are estimated using ordinary least squares regressions of $R_{i,t}$ on $R_{m,t}$ over the estimation period of 200 to 21 days before the event day. When fewer daily data are available, the estimation window starts as late as 121 days before the event day. Let T_{0i} and T_{1i} denote the beginning and the end of the estimation window for security *i*. L_i is the number of observations in the estimation window for security *i*. In almost all cases, $T_{0i} = -200$, $T_{1i} = -20$ and therefore $L_i = 180$.

To check the robustness of the results, we use also a market-adjusted return model of the form:

$$AR_{i,t} = R_{i,t} - R_{m,t} \qquad \text{for } t = -20,...,20 \tag{3}$$

The market-adjusted return model can be viewed as a restricted market model with α_i constrained to zero and β_i constrained to one.

Several studies (e.g. Rozeff and Zaman (1988) on a U.S. sample, and Gregory et al. (1994) on a U.K sample) highlight the importance of controlling for size in the case where the abnormal returns are calculated over a long post-event window, or for a sample including a large number of smaller companies. Rozeff and Zaman (1988) argue that abnormal returns are higher for smaller companies. If directors' purchases tend to be concentrated in the stock of smaller firms, and if this stock tends to earn positive abnormal returns, then the abnormal returns on directors' trading might be partly attributable to the size effect. Several size-adjustment methods have been proposed. We opt for the method of Lakonishok, Shleifer and Vishny (1994). According to this method, return $R_{i,t}$ for security *i* on day *t* is adjusted by return $R_{p(i),t}$ on the size control portfolio, *p* which security *i* belongs to. Usually, ten size control portfolios are formed based on all the market

capitalization of all the securities at the beginning of the calendar year. For each size control portfolio, an equally weighted average return is then computed. Then, the size adjusted abnormal return, $AR_{i,t}$, for security i on day t is defined as:

$$AR_{i,t} = R_{i,t} - R_{p(i),t}. \qquad \text{for } t = -20,...,20. \qquad (4)$$

In general, this is a specific form of the market-adjusted model defined in (3). This model has the big advantage of reasonably low data requirements. An alternative model would be the model of Dimson and Marsh (1986) that accounts for size adjustment using size control portfolio betas. However, Gregory et al. (1997) report that the difference between the Dimson-Marsh benchmark and the Lakonishok et al. benchmark is relatively small for U.K. data.

3.4.1.2 Test statistics

The cross-sectional average abnormal return for day *t*, AAR_t, is defined as the average over all abnormal returns for that day:

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{i,t} \qquad \text{for } t = -20,...,20, \qquad (5)$$

The cumulative abnormal return for security *i* from day t_1 to day t_2 is defined as sum of all firm's abnormal returns over that period:

$$CAR_i = \sum_{t=t_1}^{t_2} AR_{i,t} \qquad \text{for } i = 1,...,N, \qquad (6)$$

where *N* is the number of securities. Cumulative average abnormal returns from day t_1 to day t_2 are then defined as the cross-sectional average of the cumulative abnormal returns across the individual securities:

$$CAAR_{t_1,t_2} = \frac{1}{N}\sum_{i=1}^{N} CAR_i = \frac{1}{N}\sum_{i=1}^{N}\sum_{t=t_1}^{t_2} AR_{i,t} \quad \text{for } -20 \le t_1 < t_2 \le 20. \qquad (7)$$

To test the null hypothesis that the cumulative average abnormal returns are equal to zero for a sample of *N* securities, we use three parametric test statistics:

$$t_{CAAR} = \frac{\frac{1}{N}\sum_{i=1}^{N} CAR_i}{s(CAR)/\sqrt{N}}, \tag{8}$$

$$J_1 = \frac{CAAR}{s(CAAR)}, \text{ and} \tag{9}$$

$$J_2 = \sqrt{\frac{N(L_i - 4)}{L_i - 2}} \frac{1}{N}\sum_{i=1}^{N} \frac{CAR_i}{s(CAR_i)}, \tag{10}$$

where CAR_i is the cumulative abnormal return for security i defined as in (6) and $s(CAR)$ is the sample (cross-sectional) standard deviation of the cumulative abnormal returns. $CAAR$ is the cumulative average abnormal return defined as in (7), and $s(CAAR)$ can be computed as:

$$s(CAAR) = \sqrt{\frac{1}{N^2}\sum_{i=1}^{N}\sum_{t=t_1}^{t_2} s_i^2} \tag{11}$$

where s_i is an estimator for the standard error of abnormal returns for security i. A suitable choice is the usual sample standard error from the market model regression over the estimation window:

$$s_i = \sqrt{\frac{1}{L_i - 2}\sum_{t=T_{0i}}^{T_{1i}} \left(R_{i,t} - \hat{\alpha}_i - \hat{\beta}_i R_{m,t}\right)^2}. \tag{12}$$

$s(CAR_i)$ is the sample standard deviation of the individual cumulative abnormal returns:

$$s(CAR_i) = \sqrt{\sum_{t=t_1}^{t_2} s_i^2} \qquad \text{with } s_i^2 \text{ defined as in (11).} \tag{13}$$

The test statistic t_{CAAR} in (8) is based on Barber and Lyon (1997). It is Student-t distributed with N-1 degrees of freedom and approaches the normal distribution as N increases. J_1, and J_2 are based on Campbell et al. (1997). Both are asymptotically normally distributed. This distributional pattern is not exact for J_1 because an estimator of variance

appears in the denominator. In turn, J_2 gives equal weighting to the individual standardized cumulative abnormal returns, $CAR_i / s(CAR_i)$. The power of these two tests depends on the behaviour of the true abnormal returns. If the true abnormal returns are constant across securities, then it is better to opt for a measure which gives more weight to the securities with the lower abnormal return variance, which is what J_2 does. However, if the true abnormal returns are larger for securities with a higher variance, it is better to give equal weight to the realized cumulative abnormal return of each security, which is what J_1 does. As the variance of the CARs is of similar magnitude across securities, our results are not expected to be sensitive to the use of J_1 or J_2 (see below).

3.4.2 Robustness checks on the test-statistics

The methodology proposed above is based on an assumption that returns are jointly normal and temporally independently and identically distributed. Below, we discuss the robustness checks we use to test whether the following assumptions are valid: (i) non-normality of abnormal returns, (ii) non-synchronous trading, (iii) event clustering, (iv) autocorrelation of abnormal returns, and (v) event-induced change in variance.

3.4.2.1 Non-normality of abnormal returns

Campbell and Wasley (1993) show that the daily returns of NASDAQ shares deviate to a much larger extent from the normal distribution than NYSE/ASE stocks. Our sample of firms is closer to the characteristics of NASDAQ shares as some suffer from thin trading and have higher bid-ask spreads. Still, the violation of normality in daily returns may not be a serious issue because our data set is very large. Campbell and Wasley (1993) show that for portfolios of 100 securities the distributional characteristics of the returns indicate normality.

To be on the safe side, we employ the non-parametric test of Corrado (1989) to check the robustness of our results with respect to non-normality and other possible problems. The non-parametric rank statistic, introduced by Corrado (1989), does not require abnormal returns to be normally distributed. Campbell and Wasley (1993) document that this rank statistic is consistently the best specified and most powerful test statistic across

numerous event conditions. It is robust to multi-day event periods, clustered event dates, and increases in variance on the event day.[34]

The rank test is implemented by ranking the abnormal returns over the estimation *and* event windows: $k_{i,t} = rank\left(AR_{i,t}\right)$ for $t = -200,...,20$. This process implies that $AR_{i,t_1} < AR_{i,t_2} \Rightarrow k_{i,t_1} < k_{i,t_2}$. The rank statistic is then the ratio of the mean deviation of the securities' day-0 ranks, $k_{i,0}$, to the estimated standard deviation of the portfolio mean abnormal rank:

$$t_{rank} = \frac{\frac{1}{N}\sum_{i=1}^{N}\left(k_{i,0} - \bar{k}_i\right)}{s_k}, \tag{14}$$

where $s_k^2 = \frac{1}{221}\sum_{t=-200}^{20}\left(\frac{1}{N}\sum_{i=1}^{N}\left(k_{i,t} - \bar{k}_i\right)\right)^2$, and $\bar{k}_i = \frac{1}{221}\sum_{t=-200}^{20} k_{i,t} = 111$.

The rank statistic for the multi-day event period is defined as follows:

$$t_{rank} = \frac{\sum_{t=t_1}^{t_2}\left(\frac{1}{N}\sum_{i=1}^{N}\left(k_{i,t} - \bar{k}_i\right)\right)}{\sqrt{\sum_{t=t_1}^{t_2} s_k^2}}. \tag{15}$$

Both rank statistics approach unit normality as the number of securities in the portfolio increases.

3.4.2.2 Non-synchronous trading

The nontrading or non-synchronous trading effect arises when prices are assumed to be recorded at time intervals of one length when in fact they are recorded at time intervals of other, possibly irregular lengths (MacKinlay, 1997). Thus, non-synchronous trading can lead to biased betas in the market model. Scholes and Williams (1977) and Dimson (1979) present a consistent estimator of beta in the presence of nontrading that adjusts the nontrading beta estimates upwards compared to the unadjusted estimates. This results in smaller abnormal returns for thinly traded securities. However, Jain (1986) shows that, in general, the adjustment for thin trading is not important. Campbell and Wasley (1993) also

[34] In comparison to the standardized test statistic and to the portfolio test statistic.

conclude that adjustment according to Scholes and Williams (1977) does not improve the Type I error or the power of parametric test statistics. Furthermore, they show that the rank statistic using the market model abnormal returns performs best. Therefore, we also rely on the rank test for the robustness checks of the test-statistics of firms suffering from thin trading.

3.4.2.3 Event clustering

When computing the variance of cumulative abnormal returns according to (11) or (13), we make an assumption that the event windows of the included securities do not overlap.[35] This assumption of absence of clustering allows us to calculate the variance of the aggregated sample's cumulative abnormal returns without concern about the covariances across securities because they are zero (MacKinlay, 1997). Accordingly, clustering may bias the parametric tests. Still, Brown and Warner (1985) conclude that, in general, the use of daily or weekly data makes clustering of events on a single day much less severe than the use of monthly data. Also, diversification across industries further mitigates the problem (Bernard, 1987). The rank statistic solves the event-clustering problem as it takes cross-sectional dependence into account via the aggregation of individual security abnormal returns into time series of portfolio mean ranks. Campbell and Wasley (1997) show that the rank test is again well specified, also for multi-day event periods. Therefore, the rank test is a good robustness check in case of event clustering.

3.4.2.4 Autocorrelation of abnormal returns and event-induced variance

For hypothesis tests over intervals of more than one day, autocorrelation of the abnormal returns should be taken into consideration. Failure to do so may result in misspecification of the estimated variance of the cumulative average abnormal returns. Even though Brown and Warner (1985) show that autocorrelation is present, they conclude that the benefits from autocorrelation adjustments appear to be limited. Campbell

[35] Event clustering is not a serious problem in this study as the average number of events (insider transactions) per firm over the 8-year period 1991-1998 is 2.86 (purchases) and 2.77 (sales) with medians of 2 for both the sales and the purchases.

and Wasley (1993) draw a similar conclusion: they show that test statistic specifications are not significantly affected by serial dependence.

A shift in the variance and the mean of the returns on the event day resulting from the release of new information may cause another type of misspecification, namely, event-induced variance. Still, Campbell and Wasley (1993) show that the rank test is not liable to such misspecification.

3.5 Results

This section presents the empirical results of the study. First, we report the event study results capturing the market reaction to directors' net purchases and sales. Second, we test the information hierarchy hypothesis on the market reaction across different categories of directors. And finally, we outline the impact of different types of blockholders on information content of directors' transactions.

3.5.1 Market reaction to directors' trades

To test Hypotheses 1-8, we estimated average abnormal returns around the announcement of directors' transactions using event study methodology.[36]

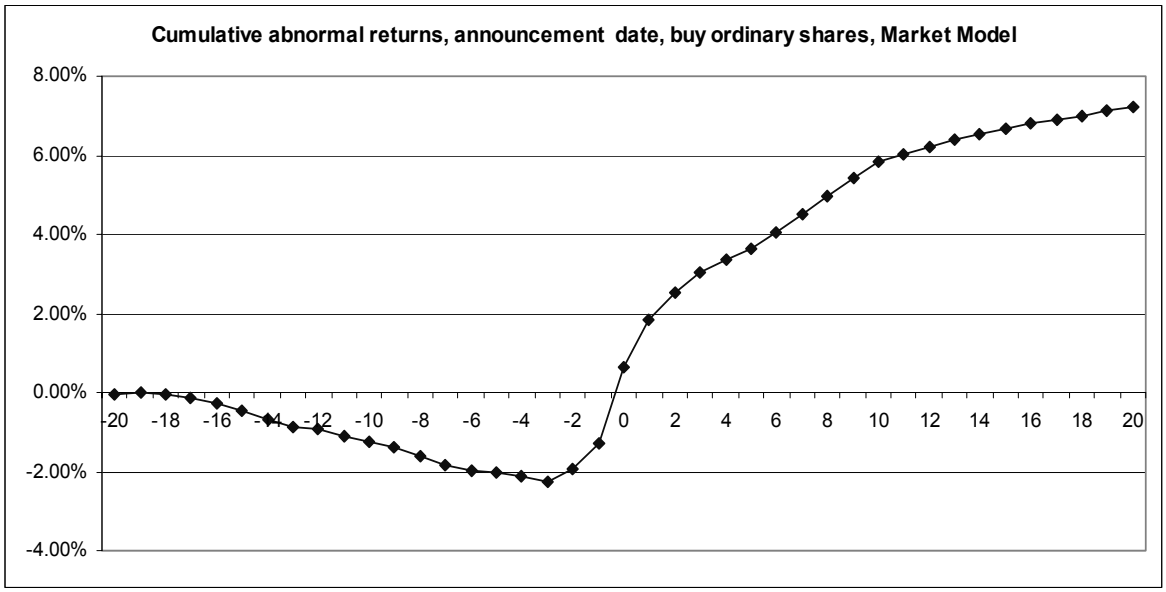
3.5.1.1 Market reaction to purchases

The results reported in Table 3.2 and Figure 3.1 strongly support Hypothesis 1a. There is a very strong positive market reaction to directors' purchases. This confirms the high information content of these transactions. The average abnormal returns on the announcement day and the subsequent day are both significant and over 1.5 percent such that the two-day CAAR based on the market model amounts to 3.12 percent (Table 3.2). The positive CAAR is strongly statistically significant as are the CAARs based on the market-adjusted and size-adjusted models, whatever the type of test used. As the transaction day may not necessarily coincide with the announcement day, we also show in

[36] The final sample of directors' purchases and sales in the shares of their own firms is described in Section 3.3.5 in the text and in Appendix 6.

Panel A the market reaction following the transaction day. As in 37 percent of the cases the purchase transaction is announced on the same day the trade was executed and in 27 percent of the cases the transaction is announced the day after the trade was made, the results are very similar.[37]

FIGURE 3.1: MARKET REACTION TO DIRECTORS' PURCHASES: CUMULATIVE AVERAGE ABNORNAL RETURNS AROUND THE ANNOUNCEMENT DAY, MARKET MODEL



Positive average abnormal returns associated with a director's purchases are persistent over the whole 20-day period following the transaction (see Figure 3.1) and the CAAR amounts to 8.47 percent including the announcement reaction. Table 3.2 also shows that the CAAR is significantly negative (–1.27 percent) over the twenty days prior to the purchase transaction. This suggests that directors time their purchases of shares well.[38]

In summary, our results document that larger directors' purchases (defined as covering at least 0.1 percent of the equity outstanding) contain new information. The directors'

[37] In the regressions (results reported in Tables 4-7), we use the two-day CAR(0;1) as the dependent variable whereby 0 is the announcement day. Our results indicate that the market reacts positively to directors' purchases already on the transaction date. However, it is possible on the transaction day, the market is not aware that the transaction is initiated by an insider. Therefore, we opt for the announcement date.

[38] Our results suggest that directors can properly time their purchases despite the fact that they have to ask for clearance to trade from the chairman of the board. It seams that the clearance is usually granted quite promptly.

TABLE 3.2: MARKET REACTION TO DIRECTORS' PURCHASES: EVENT STUDY

This table reports the results of an event study estimating the market reaction to directors' purchases of ordinary voting shares that represent at least 0.1 percent of company's market capitalization. Only net transactions are taken into consideration. For the estimation, the market model $AR_{it} = R_{it} - (\alpha_i + \beta_i * R_{mt})$, the market adjusted model, $AR_{i,t} = R_{i,t} - R_{m,t}$, and the size-adjusted model of Lakonishok et al. (1994), $AR_{i,t} = R_{i,t} - R_{p(i),t}$, were used. The parameters α_i and β_i were estimated for each stock over the window from day –200 to –21 in a regression of the following form: $R_{it} = \alpha_i + \beta_i * R_{mt} + e_{it}$. Where less daily returns were available, the estimation window was reduced down to (–121; -21). [a] The number of observations for the individual models differs because the models have differing daily-return data requirements and consequently some events had to be excluded since abnormal returns could not be computed.

	CAAR (-20;-1)	CAAR (0;1)	CAAR (0;3)	CAAR (0;5)	CAAR (0;20)	# obs.[a]
ANNOUNCEMENT DATE						
market model						
CAAR	-1.27%	3.12%	4.30%	4.88%	8.47%	1861
t_{CAAR}	-2.66	14.84	17.06	17.08	19.69	
J_1	-3.63	28.29	27.55	25.54	23.67	
J_2	-11.81	41.30	40.84	38.24	36.81	
t_{rank}	-2.50	9.17	9.34	8.25	7.82	
market-adjusted model						
CAAR	-2.78%	2.94%	3.91%	4.30%	6.27%	1889
t_{CAAR}	-5.96	14.23	16.01	15.74	16.19	
J_1	-7.78	26.05	24.53	22.03	17.14	
J_2	-11.99	29.45	28.30	25.28	19.69	
t_{rank}	-2.82	8.15	8.81	8.27	8.15	
size-adjusted model						
CAAR	-3.27%	2.89%	3.94%	4.36%	6.78%	1686
t_{CAAR}	-6.44	13.10	14.98	14.72	15.99	
J_1	-8.59	24.04	23.14	20.93	17.40	
J_2	-13.56	27.63	26.73	23.87	20.55	
t_{rank}	-1.66	8.78	8.93	8.13	8.65	
TRANSACTION DATE:						
market model						
CAAR	-2.48%	3.15%	4.79%	5.45%	9.43%	1915
t_{CAAR}	-5.57	13.79	17.19	17.94	20.58	
J_1	-7.26	29.21	31.42	29.18	26.97	
J_2	-16.68	39.70	45.00	42.42	40.71	
t_{rank}	-3.79	8.91	10.06	9.38	8.79	
market-adjusted model						
CAAR	-3.92%	2.93%	4.39%	4.85%	7.24%	1942
t_{CAAR}	-8.97	12.91	16.11	16.48	17.37	
J_1	-11.18	26.41	28.02	25.26	20.16	
J_2	-15.71	28.94	31.44	28.59	22.69	
t_{rank}	-3.38	8.94	9.98	9.43	8.13	
size-adjusted model						
CAAR	-4.37%	2.77%	4.30%	4.82%	7.63%	1732
t_{CAAR}	-9.07	11.61	14.77	15.31	16.74	
J_1	-11.67	23.38	25.72	23.51	19.90	
J_2	-17.09	26.62	29.30	26.95	22.93	
t_{rank}	-2.94	8.25	9.60	9.12	9.28	

purchase transactions signal positive news about the company value. These findings suggest that when informed directors increase their holdings in the company, they signal their confidence in the future prospects of the company. This confirms Hypothesis 1a. Friederich et al. (2002) document a similar pattern for their sample of directors' purchases in 196 'mid-cap' U.K. companies over the period since 1986 till 1994. Their CAAR over a two-day window following the transaction day is 0.42 percent, is highly significant and robust to different parametric and non-parametric tests. Also CAARs for the U.S. as reported in Lakonishok and Lee (2001) are positive, however, their magnitude is lower. In particular, the five-day CAARs are 0.13 and 0.59 percent following the reporting and trading day, respectively, for all trades by managers in all U.S. firms listed on the NYSE/AMEX/NASDAQ over the period 1975-1995. These two papers report lower abnormal returns compared to our CAARs for purchases. We attribute the difference to the higher information content of larger directors transactions analyzed in our study.

All our results regarding the information content of directors' purchases are robust to different model specifications (market model, market-adjusted model and size-adjusted model) and to the sensitivity checks of the rank test.

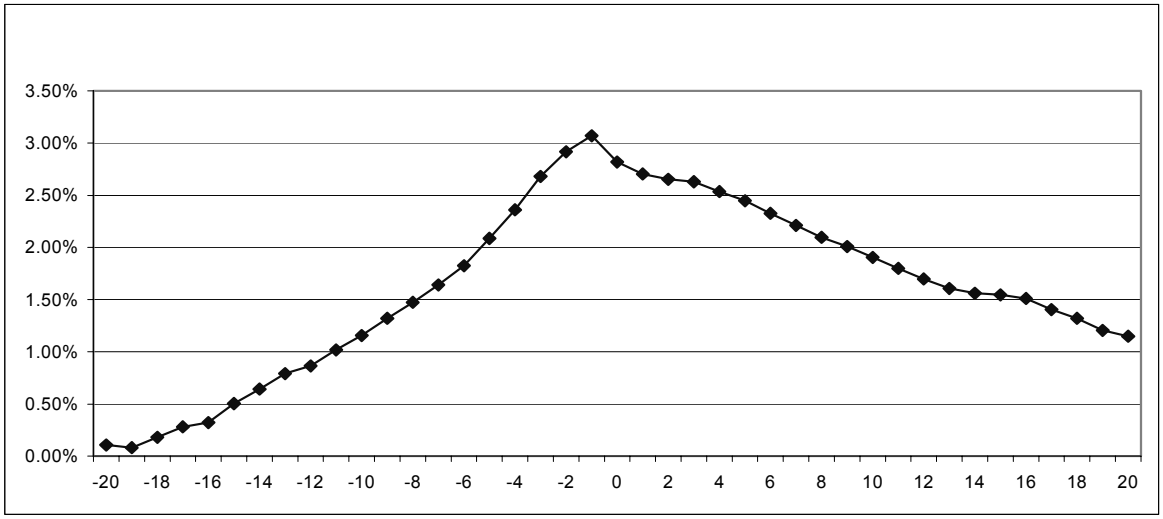
3.5.1.2 Market reaction to sales

Table 3.3 shows that the market reacts negatively to announcements of large net directors' sales. The CAAR measured over the two days at and after the announcement is –0.37 percent, is significant, and decreases to –1.92 percent after 20 trading days.[39] This negative stock performance follows a period of positive abnormal returns of 3.07 percent over the twenty days preceding the announcement. Figure 3.2 depicts the price developments over the 41-day window centred on the announcement day of directors' sales. As with purchases, the positive price movement prior to the directors' sales suggests that directors time their transactions.

We conclude that directors' sales are also information-revealing events and are interpreted as negative news which confirms the Hypothesis 1b. Table 3.3 also shows that the market reaction to the transaction date of the directors' sales is less robust in terms of

[39] The CAARs based on the market-adjusted and size-adjusted models are smaller, -0.21% and –0.24% respectively, but are also strongly statistically significant.

FIGURE 3.2: MARKET REACTION TO DIRECTORS' SALES: CUMULATIVE AVERAGE ABNORNAL RETURNS AROUND THE ANNOUNCEMENT DAY, MARKET MODEL



statistical significance: the non-parametric rank tests show strong statistical significance whereas most parametric tests do not, presumably because the distributional assumptions of these tests are not valid. This suggests that the market does not observe the transaction itself but reacts to the trade at the announcement of the transaction. This contrasts with results for the directors' purchases event although a deviation between the transaction and announcement dates of sales is similar to purchases. In 41 (28) percent of the sales transactions, these trades are made public on the same day the trade was made (the next day).

Our findings confirm previous U.K. evidence (Friederich et al., 2002) of significantly negative market reaction to directors' sales (CAAR of –0.17 over two days following the transaction). In contrast, U.S. directors' sales do not seem to convey information to the market. Lakonishok and Lee (2001) find that the CAAR over a five-day period starting from the announcement day is –0.23 percent but insignificant. Our CAAR(0,5) amounts to a significant –0.62 percent, more than twice as high. How can this difference be explained? First, unlike Lakonishok and Lee (2001), we exclude sales following the exercising of options by directors. Such sales presumably reveal less information as the market participants may expect that directors sell the shares resulting from option schemes

TABLE 3.3: MARKET REACTION TO DIRECTORS' SALES: EVENT STUDY

This table reports the results of an event study estimating the market reaction to directors' sales of ordinary voting shares that represent at least 0.1 % of company's market capitalization. Only net transactions are taken into consideration. For the estimation, the market model $AR_{it} = R_{it} - (\alpha_i + \beta_i * R_{mt})$, the market adjusted model, $AR_{i,t} = R_{i,t} - R_{m,t}$, and the size-adjusted model of Lakonishok et al. (1994), $AR_{i,t} = R_{i,t} - R_{p(i),t}$, were used. The parameters α_i and β_i were estimated for each stock over the window from day –200 to –21 in a regression of the following form: $R_{it} = \alpha_i + \beta_i * R_{mt} + e_{it}$. Where less daily returns were available, the estimation window was reduced down to (–121; -21). [a] The number of observations for the individual models differs because the models have differing daily-return data requirements and consequently some events had to be excluded since abnormal returns could not be computed.

	CAAR (-20;-1)	CAAR (0;1)	CAAR (0;3)	CAAR (0;5)	CAAR (0;20)	# obs.[a]
ANNOUNCEMENT DATE						
market model						
CAAR	3.07%	-0.37%	-0.44%	-0.62%	-1.92%	2004
t_{CAAR}	8.68	-4.69	-4.18	-4.81	-7.75	
J_1	14.38	-5.42	-4.62	-5.32	-8.78	
J_2	22.74	-7.01	-6.28	-6.49	-9.58	
t_{rank}	7.58	-4.92	-4.34	-3.76	-5.42	
market-adjusted model						
CAAR	4.55%	-0.21%	-0.12%	-0.10%	-0.13%	2024
t_{CAAR}	13.41	-2.63	-1.11	-0.74	-0.55	
J_1	20.22	-2.90	-1.16	-0.77	-0.56	
J_2	22.98	-4.04	-2.69	-1.69	-1.16	
t_{rank}	7.01	-4.81	-4.53	-3.79	-5.27	
size-adjusted model						
CAAR	4.93%	-0.24%	-0.15%	-0.19%	-0.15%	1642
t_{CAAR}	12.29	-2.72	-1.23	-1.30	-0.55	
J_1	19.51	-3.06	-1.31	-1.38	-0.59	
J_2	20.99	-4.55	-2.95	-2.42	-0.97	
t_{rank}	6.63	-4.03	-3.39	-3.30	-4.42	
TRANSACTION DATE:						
market model						
CAAR	3.24%	-0.07%	-0.25%	-0.40%	-1.73%	2057
t_{CAAR}	8.68	-0.75	-2.11	-2.81	-7.07	
J_1	15.51	-1.07	-2.71	-3.53	-8.07	
J_2	23.74	-2.15	-4.13	-4.39	-8.47	
t_{rank}	7.62	-3.22	-4.32	-4.08	-5.42	
market-adjusted model						
CAAR	4.65%	0.07%	0.04%	0.08%	-0.04%	2078
t_{CAAR}	13.03	0.75	0.32	0.53	-0.17	
J_1	20.78	1.00	0.38	0.61	-0.18	
J_2	22.93	-1.31	-1.87	-0.99	-1.08	
t_{rank}	6.77	-3.17	-4.38	-3.82	-5.46	
size-adjusted model						
CAAR	5.13%	0.06%	0.02%	0.02%	0.03%	1690
t_{CAAR}	12.11	0.51	0.15	0.10	0.11	
J_1	20.41	0.71	0.18	0.12	0.11	
J_2	21.63	-2.02	-2.44	-1.74	-0.81	
t_{rank}	6.83	-3.13	-3.35	-3.25	-4.18	

as the proceeds form part of their remuneration package.[40] Thus, our sample of sales transactions may retain those transactions expected to reveal more information. Second, we analyze only the larger transactions (0.1 percent of market capitalization).

As conjectured in Hypothesis 1c, the market reaction to purchases is higher than that to sales, a finding also documented for the U.S. market in Lakonishok and Lee (2001). The fact that directors' purchases seem to contain more information was also observed by Jeng et al. (1999) for U.S. firms and Friederich et al. (2002) for the U.K. The reason for this phenomenon may be that markets discount the information content of sales more as part of directors' sales may occur for liquidity and diversification needs. In contrast, directors' purchases potentially can have a negative impact on their wealth (and risk) and may hence be more informative on their expectations of the future firm value. The results for directors' sales, measured by the various CAARs, are robust to all parametric and non-parametric sensitivity checks.

3.5.2 Test of the information hierarchy hypothesis

Hypothesis 2 relates to the information hierarchy of the different categories of directors. It postulates that directors who are more familiar with the day-to-day operations of the company trade on more valuable information. We distinguish between five categories of directors: CEOs (including joint CEO-chairmen), other executive directors (the deputy CEO and the financial officer), chairmen (non-executives in more than 90 percent of the cases), other incumbent directors (both executive and non-executive directors that are not included in the previous categories), and former directors. The categories are listed in decreasing order of the superior information they are supposed to possess. The category of 'other incumbent directors' includes both executive and non-executive directors, as the database does not distinguish between the two. Still, as the three more senior executive directors are already included in the first two categories and there are usually on average three executive directors on the board, the vast majority of directors in this category are

[40] Similar argument was put forward, for example, in Friederich et al. (2002), Jeng et al. (1999), and Lustgarden and Mande (1995).

non-executives. Former directors are those directors who resigned or were dismissed within the financial year preceding the transaction.

We test the information hierarchy hypothesis in two ways. First, we estimate average abnormal returns for each of the individual groups of directors and compare the estimates. Second, we use a regression analysis with CARs as the dependent variable and dummy variables representing the individual groups as explanatory variables. A multivariate model allows us to control for other factors such as the transaction size, firm size, industry, or accounting variables and determine the relationship more reliably.[41]

3.5.2.1 Purchase transactions by director category

Table 3.4 reports the results of individual event studies for different categories of directors. The J-form pattern around purchase transactions that was documented for the whole sample (Figure 3.1) persists for all the subsamples. For all the different categories of directors, the CAARs are significantly negative over the twenty days prior to the announcement but turn positive around the announcement day. In general, the two-day CAARs covering the announcement day as well as the next day range from 2.4 percent to 3.8 percent, and are strongly statistically significant. Still, these results do not support the information hierarchy hypothesis (Hypothesis 2) as the differences between the CAARs by category of director are not statistically significant, apart from the differences between CAARs of CEOs, and, respectively, other incumbent directors and former directors (Table 3.4). Surprisingly, the market reaction is the weakest when CEOs purchase shares in their own company and is the strongest after purchase transactions of former directors (see infra).

Table 3.5 summarizes the regression results for directors' purchases. The dependent variable in these regressions is the two-day CAR covering the announcement day and the following day for each firm-event using the market model as a benchmark. In order to construct the mutually exclusive director categories (as used in Model 1), we employ the following algorithm. The CEO dummy variable is set to one if a CEO is involved in a (net) purchase, regardless of whether any other director also purchases on the same day.

[41] For a discussion of the control variables see Section 3.5.4.

Next, the 'other top executives' dummy is set to one whenever a deputy CEO or a financial director trades and when the CEO does not trade. The dummies for chairman, other incumbent directors, and former directors are constructed in a similar way. We control for the transaction size and firm size (market capitalization at the beginning of the year) and whether or not there are multiple purchases. The fact that, on some days, more than one director of the same company purchases shares may strengthen the signal.

The results of Table 3.5 confirm that all categories of directors trigger positive and statistically significant abnormal returns (Model 1). The information effect of the CEO's share purchases is the smallest although CEOs are assumed to have the best knowledge about their company's prospects. A similar finding was documented in Jeng et al. (1999) for a U.S. sample. Even though the low information content of CEO purchases (in relation to the other categories of directors) goes against the information hierarchy hypothesis, it may be explained as follows. First, as argued in Jeng et al. (1999), market participants

TABLE 3.4: MARKET REACTION TO DIRECTORS' PURCHASES BY DIRECTOR CATEGORIES

This table reports the results of an event study as described in Table 3.2. For each estimation window, cumulative average abnormal returns and t-statistics are reported. *'CEOs'* stands for the announced dealings of chief executive officers (or managing director if a firm does not have a CEO). '*Top executive directors'* covers the transactions by CEOs (including managing directors), deputy CEOs (including deputy managing directors), and financial directors. *'Chairmen'* corresponds to the dealings of the chairmen of the board. *'Other incumbent directors'* represents dealings of all those directors who are not included in the categories CEOs, executive directors, or chairmen. *'All incumbent directors'* comprise the categories of CEOs, top executive directors, chairmen, and other incumbent directors. *'Former directors'* refers to transactions dealings of directors who retired, were dismissed or deceased during the preceding fiscal year.

[a] For the (0,1) event window, the difference in CAARs for CEO and former directors is significantly different at the 5% level (t=2.07), as is the differences in CAARs of CEOs and other incumbent directors at 10% (t=1.91).

	CAAR (-20;-1) t-stat	**CAAR (0;1)** t-stat	**CAAR (0;3)** t-stat	**CAAR (0;5)** t-stat	**CAAR (0;20)** t-stat	**# obs.**
CEOs	-2.76%	2.38%[a]	3.71%	4.53%	9.28%	582
	-3.76	6.35	8.55	9.37	11.75	
top executive directors	-2.57%	2.71%	4.19%	4.98%	9.72%	677
(CEO, dep. CEO, Financial Dir.)	-3.87	7.54	9.99	10.81	13.18	
chairmen	-1.40%	3.17%	5.02%	6.26%	10.97%	493
	-1.57	6.98	9.02	9.81	11.06	
other incumbent directors	-2.12%	3.51%	5.17%	5.64%	9.24%	572
	-2.52	7.68	9.53	10.07	11.25	
all incumbent directors	-2.40%	2.92%	4.43%	5.14%	9.17%	1591
(top execs., chairmen, other incum. dirs.)	-5.12	11.86	14.81	15.74	18.54	
former directors	-2.50%	3.83%	6.34%	7.21%	11.55%	396
	-2.09	6.47	8.61	8.77	9.33	

TABLE 3.5: MARKET REACTION TO DIRECTORS' PURCHASES BY DIRECTOR CATEGORIES: CROSS-SECTIONAL REGRESSION RESULTS

This table reports cross-sectional OLS regression results with two-day CAR on the announcement day and the following day (market model benchmark, reported in Table 3.2) as the dependent variable for all explanatory variables, estimation coefficient, standard error and the t-statistic are reported. *'CEO'* represents a dummy that is equal to one if the corresponding director dealing involves a chief executive director or a managing director. *'CEO – multiple purchases'* corresponds to a dummy that is equal to one when a chief executive director or a managing director is trading and at least one other company director is trading on the same day. *'Other top executives'* is a dummy that is set equal to one when a deputy chief executive director, a deputy managing director, or a financial director is trading and at the same time no CEO is trading. *'Chairman'* corresponds to a dummy that is set to one whenever the corresponding director dealing involves a chairman of the board and at the same time no CEO or other executive is trading. *'Other incumbent directors'* represents a dummy that is set equal to one whenever the corresponding dealing involves a director that is a incumbent board member but is not CEO, other executive, or chairman and at the same time no CEO, other executive, or chairman is trading. *'Incumbent directors'* represents a dummy that is equal to sum of CEO, other top executives, chairman, and other incumbent directors dummies. *'Former directors'* represents a dummy that is equal to one in case a retired, dismissed or deceased director is trading and at the same time no incumbent director is trading. *'Other top executives (chairmen, other incumbent dirs, or former dirs) – multiple purchases'* corresponds to a dummy that is equal to one when at least one director of the corresponding category is trading and at the same time another company director is also trading. *'Multiple purchases'* is a dummy equal to one whenever more than one director trades on the same day. *'Transaction size'* is defined as the total number of shares transacted by directors of given company on the corresponding day over total number of shares outstanding at the beginning of the calendar year. *'Mrkt. capitalization'* corresponds to total number of shares outstanding at the beginning of the year multiplied by the share price on the first trading day of that year.

In Models 1, 3, 4, and 6 all directors categories dummies are included as fixed effects (they are mutually exclusive and sum up to a vector of ones). In Models 2, and 5 one of the director categories is dropped and serves as a corresponding category (consequently, they indicate significance of differences between all the categories towards the dropped category).

Panel A:	**Model 1**			**Model 2**			**Model 3**		
	coef.	std.dev.	t-stat.	coef.	std.dev.	t-stat.	coef.	std.dev.	t-stat.
constant				**0.026**	0.0091	2.87			
CEO	**0.026**	0.0091	2.87				**0.025**	0.0093	2.68
CEO – multiple purchases							**0.019**	0.0097	1.95
other top executives	**0.050**	0.0134	3.72	**0.024**	0.0110	2.14	**0.045**	0.0145	3.08
other top exec. – multiple purchases							0.033	0.0236	1.41
chairman	**0.034**	0.0092	3.68	0.008	0.0065	1.20	**0.035**	0.0093	3.77
chairman – multiple purchases							0.003	0.0154	0.19
other incumbent directors	**0.036**	0.0093	3.89	0.010	0.0062	1.63	**0.037**	0.0094	3.93
other cur. dirs – multiple purchases							0.004	0.0172	0.22
former directors	**0.046**	0.0090	5.12	**0.020**	0.0072	2.76	**0.046**	0.0091	5.02
former directors – multiple purchases							0.016	0.0211	0.74
multiple purchases	**0.014**	0.0068	2.12	**0.014**	0.0068	2.12			
transaction size	**-0.218**	0.0647	-3.37	**-0.218**	0.0647	-3.37	**-0.216**	0.0650	-3.32
mrkt. capitalization	-1.102	0.7070	-1.56	-1.102	0.7070	-1.56	-1.092	0.7076	-1.54
year and industry dummies	yes			yes			yes		
Adj. R^2	10.44%			1.52%			10.33%		
number of observations	1906			1906			1906		

Table 3.5 continued

Panel B:	**Model 4**			**Model 5**		
	coef.	std.dev.	t-stat.	coef.	std.dev.	t-stat.
constant				**0.033**	0.0083	3.93
incumbent directors	**0.033**	0.0083	3.93			
former directors	**0.045**	0.0089	5.01	**0.012**	0.0064	1.88
transaction size	**-0.186**	0.0633	-2.94	**-0.186**	0.0633	-2.94
mrkt. capitalization	0.000	0.0000	-0.33	0.000	0.0000	-0.33
year and industry dummies	yes			yes		
Adj. R^2	10.14%			1.08%		
number of observations	1907			1907		
Panel C:	**Model 6**					
CEO	**0.026**	0.0092	2.78			
CEO x transaction size	0.041	0.3051	0.13			
other top executives	**0.063**	0.0150	4.19			
other top executives x trans. size	**-4.156**	2.1124	-1.97			
chairman	**0.035**	0.0092	3.83			
chairman x transaction size	-0.216	0.1650	-1.31			
other incumbent directors	**0.035**	0.0093	3.73			
other incumbent dir. x trans. size	**0.301**	0.1325	2.27			
former directors	**0.051**	0.0090	5.70			
former directors x trans. size	**-0.802**	0.1388	-5.77			
multiple purchases	**0.015**	0.0068	2.22			
mrkt. capitalization	-1.131	0.7031	-1.61			
year and industry dummies	yes					
Adj. R^2	11.45%					
number of observations	1906					

follow the share transactions of CEOs more closely, which may cause CEOs to trade more cautiously and at less informative moments. Second, to reduce agency costs, some believe that top executives should hold company stock to increase value-maximizing incentives. Thus, purchase transactions of CEOs may take place to fulfil this 'duty' and have, consequently, lower information content. Third, the positive news associated with future prospects of the company may be adjusted downwards by the negative news that the CEO strengthens his control over the firm to a level that causes entrenchment.

Model 2 shows that the difference in the two-day CARs triggered by CEOs trading and those triggered by chairmen or other incumbent directors' purchases are not statistically significantly different. Still, the coefficient for the other top executive directors has a magnitude of almost twice that of the CEOs and the difference is significant. Why does the market react more substantially to transactions of deputy CEOs or financial officers

compared to transactions of the CEO? Apart from the explanations mentioned above, this may be due to the fact that other executive directors trade less often such that their trades may come as a bigger surprise to the market. In fact, CEOs are responsible for 30 percent of all directors' purchase transactions compared to only 6 percent for the deputy CEOs or CFOs (see Panel A in Table 3.1).[42] Another explanation is that deputy CEOs on average hold fewer shares and are thus less likely to be entrenched.

Model 3 of Table 3.5 indicates that purchases by more than one director create a stronger positive signal to the market. This model includes interaction terms between director-category dummy variables and the dummy that indicates multiple purchases. The results indicate that when both the CEO and another incumbent or former director purchase shares on the same day, the CAR is on average more than double that when only the CEO trades (see the interaction term 'CEO – multiple purchases'). Note that this is not the case for the other categories since the remaining interaction terms do not trigger significant effect. Thus, our results show that CEO purchases that are accompanied by trades by other directors have higher information content than the purchases of CEOs alone.

In Model 4 (Panel B of Table 3.5), we distinguish between the purchases of incumbent and former directors and find that former directors' trades trigger stronger market reactions. The difference in information content of these two types of transactions is significantly different from zero (see Model 5). When directors who left the company within the financial year before their transaction increase their holdings (but within that financial year), the market perceives this as a strong signal: these directors are no longer involved in the company's affairs directly but may still be well informed as they only recently left the firm. Furthermore, these directors are not likely to violate insider regulation. Thus, their purchase transactions seem to express strong confidence in future prospects of the firm.

In Models 1-5, we find that the market reaction to directors' purchases is not influenced by firm size (measured by market capitalization). Still, larger transactions do not bear more information, as the coefficient for the relative size of transactions is

[42] Also transaction size may influence the results. For results concerning this issue see Section 5.4.

significantly negative in all the models.[43] Model 6 investigates the interaction between transaction size and whether or not a specific category of director purchases shares in the company. We find a negative correction by transaction size for other top executives and former directors.[44]

In summary, we conclude that information hierarchy hypothesis (Hypothesis 2) does not hold for purchases as CEO's purchase transactions trigger the lowest CARs. Still, our results indicate that the CARs associated with former directors' purchases are high. Overall, our models are able to explain up to 11 percent of variation in the CARs. The R^2 is substantially higher for Models 1, 3, 4, and 6 where the directors' categories form mutually exclusive groups (the sum of all these dummy variables adds to one, constant term is not included) relative to Models 2 and 5 that rather contain a constant term and one of the dummy variables is dropped to serve as a reference category. This indicates that the mutually exclusive dummy variables (as fixed effects in panel regressions) pick up some unobservable characteristics of the CARs that substantially increase the R^2. Previous studies, however, report also very low R^2. Seyhun (1986), reporting R^2 around 1 percent, speculates that low coefficients of determination are caused by insider-trading regulation that discourages insiders to trade freely on the basis of their privileged information. Lin and Howe also report adjusted R^2 of 1 percent.

3.5.2.2 Sales transactions by director category

The information hierarchy hypothesis is not supported for sales transactions either. Table 3.6 shows that the information content of sales in all the directors' categories is approximately the same. CAARs around the announcement date for all directors' categories are negative (below -0.42 percent) and statistically significant. Former directors are the only group with an insignificant market reaction, the CAAR is –0.16 percent. Thus, the information hierarchy hypothesis is not confirmed for directors' sales. The pattern of the market reaction for the whole sample of sales, as depicted in Figure 3.2, is also

[43] In Table 4 and 5, we include a relative measure of transaction size (% of equity purchased or sold). Replacing this measure by an absolute measure (in GBP terms) which measures the wealth effect of the transactions yields similar results.
[44] For further discussion see Section 3.5.4.2.

TABLE 3.6: MARKET REACTION TO DIRECTORS' SALES BY DIRECTOR CATEGORIES

All variables are defined as in Table 3.4. For each estimation window, cumulative average abnormal returns and t-statistics are reported. [a] For the (0,1) event window, the difference in CAARs for incumbent and former directors is significantly different at 10% significance level. All other pair-wise tests on differences of CAARs (0;1) are not statistically significant.

	CAAR (-20;-1) t-stat	**CAAR (0;1)** t-stat	**CAAR (0;3)** t-stat	**CAAR (0;5)** t-stat	**CAAR (0;20)** t-stat	**# obs.**
CEOs	3.49%	-0.42%	-0.58%	-0.81%	-1.83%	490
	5.96	-2.86	-2.66	-2.98	-3.52	
top executive directors	3.42%	-0.48%	-0.67%	-0.95%	-2.17%	563
(CEO, dep. CEO, Financial Dir.)	5.88	-3.26	-3.17	-3.60	-4.35	
chairmen	3.19%	-0.50%	-0.56%	-0.88%	-1.79%	350
	4.72	-3.15	-2.46	-3.17	-3.10	
other incumbent directors	3.05%	-0.59%	-0.77%	-1.06%	-2.23%	684
	4.97	-4.52	-4.48	-4.97	-4.96	
all incumbent directors	3.31%	-0.46%	-0.59%	-0.84%	-2.10%	1476
(top execs., chairmen, other incum. dirs.)	8.76	-5.26	-5.05	-5.73	-7.18	
former directors	2.61%	-0.16%[a]	-0.20%	-0.18%	-1.62%	626
	3.53	-1.10	-0.98	-0.77	-3.85	

TABLE 3.7: MARKET REACTION TO DIRECTORS' SALES BY DIRECTOR CATEGORIES: CROSS-SECTIONAL REGRESSION RESULTS

All variables are as defined in Table 3.5.

Panel A:	**Model 1**			**Model 2**			**Model 3**		
	coef.	std.dev.	t-stat.	coef.	std.dev.	t-stat.	coef.	std.dev.	t-stat.
constant				**-0.009**	0.0054	-1.65			
CEO / in model 4 CEO alone	**-0.009**	0.0054	-1.65				**-0.009**	0.0055	-1.7
CEO – multiple sales							-0.004	0.0033	-1.2
other top executives	**-0.013**	0.0066	-1.98	-0.004	0.0045	-0.94	**-0.013**	0.0069	-1.89
other top exec. – multiple sales							-0.005	0.0108	-0.51
chairman	**-0.010**	0.0053	-1.85	-0.001	0.0027	-0.35	**-0.010**	0.0054	-1.88
chairman – multiple sales							-0.004	0.0058	-0.67
other incumbent directors	**-0.010**	0.0053	-1.82	-0.001	0.0022	-0.32	**-0.009**	0.0053	-1.77
other cur. dirs – multiple sales							**-0.009**	0.0049	-1.91
former directors	-0.007	0.0051	-1.33	0.002	0.0024	0.88	-0.007	0.0052	-1.42
former directors – multiple sales							-0.001	0.0055	-0.1
multiple sales	**-0.005**	0.0022	-2.02	**-0.005**	0.0022	-2.02			
transaction size	**0.064**	0.0297	2.15	**0.064**	0.0297	2.15	**0.065**	0.0299	2.16
mrkt. capitalization	-0.001	0.0005	-1.04	-0.001	0.0005	-1.04	-0.001	0.0005	-1.04
year and industry dummies	yes			yes			yes		
Adj. R^2	1.28%			0.26%			1.15%		
number of observations	1997			1997			1997		

Table 3.7 continued

Panel B:	**Model 4**			**Model 5**		
	coef.	std.dev.	t-stat.	coef.	std.dev.	t-stat.
constant				**-0.011**	0.0051	-2.18
incumbent directors	**-0.011**	0.0051	-2.18			
former directors	-0.008	0.0051	-1.52	**0.003**	0.0018	1.8
transaction size	**0.052**	0.0287	1.81	**0.052**	0.0287	1.81
mrkt. capitalization	-0.001	0.0005	-1.19	-0.001	0.0005	-1.19
year and industry dummies	yes			yes		
Adj. R^2	1.23%			0.21%		
number of observations	1997			1997		
Panel C:	**Model 7**					
CEO	-0.008	0.0055	-1.49			
CEO x transaction size	0.036	0.0728	0.49			
other top executives	-0.011	0.0068	-1.56			
other top executives x trans. size	-0.343	0.2915	-1.18			
chairman	-0.008	0.0054	-1.42			
chairman x transaction size	-0.095	0.0605	-1.57			
other incumbent directors	**-0.011**	0.0053	-2.05			
other incumbent dir. x trans. size	**0.227**	0.0756	3.01			
former directors	-0.008	0.0052	-1.46			
former directors x trans. size	**0.133**	0.0509	2.62			
multiple sales	**-0.005**	0.0022	-2.22			
mrkt. capitalization	-0.001	0.0005	-0.96			
year and industry dummies	yes					
Adj. R^2	1.76%					
number of observations	1997					

observed for all the categories of directors. The announcement of these transactions is preceded by a period of positive CAARs that turn negative after the transaction. Hence, it seems that directors time the sale of (part of) their shares.

The regression results in Table 3.7 confirm the conclusions from the event study. Hypothesis 2 is not supported. The market reacts negatively to sales transactions by all categories of incumbent directors (Model 1), but the market does not distinguish between the categories of directors (Model 2). The fact that the parameter estimate for former directors is not significant can be interpreted as a natural consequence of these directors' leaving the firm such that those transactions do not carry any information. Models 1-3 show that when more than one director sells a share stake, the market reaction is on average more negative (though this effect is not significant in Model 3). The negative share price reaction associated with directors' transactions only occurs for incumbent

directors but not for former directors (Models 4 and 5). Finally, Model 6 shows that large transactions do not trigger different market reactions than small transactions. The only exception is for the category of other incumbent directors: large sale transactions correct the negative market reaction (they are less informative). The following section includes the impact of control concentration in this analysis.

3.5.3 Test of the effect of corporate control

In this subsection we test the impact of ownership concentration on the information content of directors' trades (Hypotheses 3 to 8). The two-day CARs for each firm-event around the announcement of directors' transactions are regressed on a set of ownership concentration variables that measure the possible information content of directors' transactions in firms with different categories of blockholders: corporations, individuals or families unrelated to the directors, institutional investors, and directors. A specific ownership concentration dummy variable is set to one if a shareholder of that category owns at least 5 percent of the equity (this is our definition of a blockholder).[45]. We simultaneously control for other determinants that may influence the information content of directors' trades: transaction value, firm size, profitability, leverage, book-to-market ratio, and simultaneous trading by several directors.[46] The models also include director-category dummies as presented in the previous section.

3.5.3.1 Ownership structure: purchase transactions

In Table 3.8, we investigate the information content of directors' purchases in firms with different categories of blockholders. The results provide strong support for Hypothesis 3. The coefficient estimates measuring the information effect of active monitors – corporations, and individuals or families – are both negative, though only the coefficient for corporations is significant within the 1 percent level of statistical significance. This suggests that the positive information content of directors' purchases is mitigated by the presence of monitors. These outside blockholders oversee firm activities

[45] Dispersed ownership is the reference category.
[46] The effects of control variables are further discussed in Section 3.5.4.

and ensure that their firm is managed to maximize shareholder value. Good monitoring leads to less information asymmetry and agency costs. Therefore, the market can afford to rely less on information or signals released by the management. Our results confirm that directors' purchases convey less new information when corporations and individuals own a considerable stake in the firm. It is also possible, however, that monitoring by corporations and individuals or families not related to the management leads to fewer directors' purchases that are bases on superior information. This is because active monitors may not allow directors to engage in this type of behaviour.

TABLE 3.8: MARKET REACTION TO DIRECTORS' PURCHASES AND OWNERSHIP STRUCTURE: CROSS-SECTIONAL REGRESSION RESULTS

This table reports cross-sectional OLS regression results with dependent variable that is obtained from the event study reported in Table 3.2 (Market model) and is defined as cumulative average abnormal return on the announcement day plus the day after of all reported U.K. directors' purchases over the period since 1991 till 1998 that represent at least 0.1% of company's market capitalization. For all explanatory variables, estimation coefficient, heteroscedasticity-robust (White) standard error and the t-statistic are reported.

'Concentrated blockholder – corporations, financial institutions, individuals / families and directors' represents a set of dummy variables. The corresponding dummy variable is equal to one when a blockholder of the corresponding type holds a stake of at least 5% of the company's outstanding shares. It is set to zero otherwise. *'Dispersed ownership'* is a dummy that is set to zero whenever any blockholder is present in the company and is equal to one otherwise. *'Dominant blockholder group – corporation, financial institution, individual and directors'* represents a set of dummy variables. The corresponding dummy variable is equal to one when the combined ownership stake of all blocks of the type is the largest compared to combined stakes of other ownership types (for example, if directors together own 30% and financial institutions hold together 15%, the dummy 'dominant blockholder group – directors is set to one). *'With corporation, fin. institution, individual, or directors present'* represents an interaction term between the 'dominant' blockholder group dummy and a 'concentrated' blockholder dummy of respective type. *'Other top executives'* is a dummy that is equal to one when a deputy chief executive director, a deputy managing director, or a financial director is trading and at the same time no CEO is trading. *'Chairmen'* corresponds to a dummy that is set to one whenever a chairman of the board trades and at the same time no CEO or other executive is trading. *'Other incumbent directors'* represents a dummy that is equal to one whenever the corresponding dealing involves a director that is not a CEO, other executive, or chairman and at the same time no CEO, other executive, or chairman is trading. *'Former directors'* represents a dummy that is equal to one in case a retired, dismissed or deceased director is trading and at the same time no other director is trading. *'Multiple purchases'* is a dummy equal to one whenever more than one director trades on the same day. *'Transaction value'* is defined as natural logarithm of total number of shares transacted by directors of given company on the corresponding day times price per share at the beginning of the calendar year. *'Size'* corresponds to natural logarithm of total number of employees at the beginning of the year. *'B/M ratio'* is defined as total book value of equity over total market capitalization at the beginning of the year (divided by 1 thousand)**.** *'Profitability'* is represented by returns on equity at the beginning of the calendar year (divided by 1 million). *'Leverage'* stands for debt-equity ratio at the beginning of the year. *'Loss'* is a dummy variable that is equal to one when earnings after taxes in the previous fiscal year are negative. *'Low interest coverage'* is a dummy variable that is set to one when interest coverage at the beginning of the fiscal year is lower than two. *'Dividend decrease'* is a dummy variable that is equal to one when firm decreased or omitted dividend over previous fiscal year (over t_{-2} to t_{-1}) *'Growth firm'* is a dummy variable that is equal to one when book-to-market ratio for the previous year is lower than the median. * denotes significance at 1% level. ** denotes significance at 5% level.

Table 3.8 continued

Panel A:	**Model 1**		
	coef.	std.dev.	t-stat.
constant	**0.050**	0.0233	2.16
other top executives	0.016	0.0106	1.51
chairmen	0.002	0.0064	0.36
other incumbent directors	0.009	0.0076	1.16
former directors	**0.015**	0.0074	2.00
concentrated blockholder			
corporations	**-0.021**	0.0074	-2.84
financial institutions	**0.013**	0.0056	2.29
individuals / families	-0.010	0.0065	-1.58
directors	**-0.014**	0.0053	-2.59
multiple purchases	0.014	0.0090	1.56
transaction value	-0.001	0.0022	-0.67
size	-0.001	0.0025	-0.20
B/M ratio	-1.609	1.8743	-0.86
profitability	**1.687**	0.7000	2.41
leverage	0.002	0.0025	0.94
year and industry dummies	yes		
R^2	3.35%		
F	2.15 *		
number of observations	1428		

Hypothesis 4 postulates that the market reaction to directors' purchases is stronger when institutional investors are blockholders. There is little evidence in the literature that U.K. institutions monitor the firms whose shares they own (see e.g. Franks et al., 2001, Faccio and Lasfer, 2002). If institutions do not monitor firms, their presence as a blockholder will not have the same mitigating effect as active corporations, and individuals or families. Still, if institutional investors rely on information released by the directors or on (costly) signals emitted by the directors (such as their dealings) and act (trade) upon this information, the positive signal of directors' purchases may even be strengthened. Our findings are consistent with Hypothesis 4. The parameter estimate of the presence of financial institutions is positive and highly significant (at the 1 percent level). This implies that the market reaction is more positive for firms with institutional ownership. It reflects that institutional owners do not act as monitors and hence do not lower information asymmetry about firm value. On the contrary, our result shows that they seem to follow directors' purchases and to rebalance their portfolios accordingly.

Table 3.8 continued

Panel B:	**Model 2**		
	coef.	std.dev.	t-stat.
Constant	**0.044**	0.0226	1.95
other top executives	0.015	0.0110	1.35
Chairman	0.003	0.0064	0.52
other incumbent directors	0.009	0.0076	1.18
former directors	**0.016**	0.0075	2.15
dominant blockholder group			
dominant corporations	0.007	0.0255	0.28
with financial inst. present	-0.016	0.0233	-0.69
with indiv's/families present	0.021	0.0201	1.04
with directors present	-0.027	0.0224	-1.21
dominant financial institutions	**0.027**	0.0089	3.08
with corporation present	**-0.029**	0.0101	-2.90
with indiv's/families present	-0.013	0.0115	-1.15
with directors present	**-0.026**	0.0083	-3.10
dominant individuals/families	**-0.021**	0.0092	-2.28
with financial inst. present	0.019	0.0197	0.94
dominant directors	0.011	0.0090	1.26
with corporation present	**-0.058**	0.0264	-2.20
with financial inst. present	-0.006	0.0084	-0.67
with indiv's/families present	-0.017	0.0100	-1.75
multiple purchases	0.014	0.0090	1.62
transaction value	-0.002	0.0022	-0.70
size	0.000	0.0027	-0.16
B/M ratio	-2.289	1.8704	-1.22
profitability	**1.644**	0.7174	2.29
leverage	0.003	0.0026	0.98
year and industry dummies	yes		
R^2	4.57%		
F	2.06 *		
number of observations	1428		

The results in Panel A of Table 3.8 also support Hypothesis 5a on the information (and entrenchment) effect of directors' ownership. We postulate that the positive news contained in directors' purchases is attenuated by the danger that directors become more entrenched and hence less accountable. The parameter estimate of directors' ownership is negative and statistically significant. In the presence of large directors' ownership, directors' purchases convey two important counter-acting signals: (i) the positive news about the good future prospects and (ii) the negative news associated with increased directors' ownership which may lead to entrenchment. Our results suggest that the latter effect is quite strong.

Table 3.8 continued

Panel C:	**Model 3 loss**			**Model 4 low int. coverage**			**Model 5 div. decrease**		
	coef.	std.dev.	t-stat.	coef.	std.dev.	t-stat.	coef.	std.dev.	t-stat.
Constant	**0.045**	0.0230	1.95	**0.044**	0.0233	1.87	**0.048**	0.0234	2.04
other top executives	0.012	0.0114	1.07	0.015	0.0125	1.17	0.009	0.0107	0.89
Chairman	-0.004	0.0066	-0.58	-0.006	0.0071	-0.89	0.002	0.0073	0.34
other incumbent directors	0.007	0.0076	0.94	0.010	0.0079	1.28	0.007	0.0082	0.85
former directors	**0.024**	0.0090	2.66	**0.023**	0.0094	2.47	**0.017**	0.0085	2.02
concentrated blockholder									
corporations	**-0.020**	0.0064	-3.08	**-0.020**	0.0068	-2.96	**-0.021**	0.0090	-2.38
financial institutions	**0.012**	0.0061	1.96	**0.014**	0.0063	2.21	**0.012**	0.0063	1.97
individuals / families	-0.010	0.0069	-1.38	**-0.018**	0.0067	-2.61	-0.011	0.0075	-1.52
directors	**-0.011**	0.0062	-1.72	-0.010	0.0061	-1.61	**-0.010**	0.0060	-1.70
interaction term: dir. category x performance dummy									
CEO	**0.052**	0.0244	2.11	**0.038**	0.0213	1.79	0.001	0.0201	0.05
other top executives	**0.063**	0.0319	1.97	0.041	0.0277	1.50	0.027	0.0383	0.70
chairman	**0.071**	0.0272	2.60	**0.056**	0.0228	2.45	-0.003	0.0226	-0.13
other incumbent directors	**0.062**	0.0278	2.24	0.035	0.0245	1.41	0.010	0.0222	0.44
former directors	0.023	0.0267	0.87	0.016	0.0236	0.68	-0.013	0.0242	-0.55
interaction term: blockholder x performance dummy									
corporations	-0.011	0.0175	-0.66	-0.011	0.0149	-0.73	0.002	0.0174	0.14
financial institutions	-0.031	0.0200	-1.53	-0.022	0.0172	-1.30	0.006	0.0163	0.40
individuals / families	-0.008	0.0173	-0.48	0.018	0.0149	1.18	0.008	0.0162	0.48
directors	**-0.028**	0.0161	-1.72	-0.017	0.0134	-1.25	-0.014	0.0144	-0.94
dispersed	**-0.056**	0.0253	-2.22	-0.032	0.0220	-1.46	0.016	0.0250	0.63
multiple purchases	0.013	0.0089	1.48	0.013	0.0090	1.44	0.013	0.0091	1.41
transaction value	-0.001	0.0022	-0.53	-0.001	0.0022	-0.49	-0.001	0.0022	-0.58
size	-0.001	0.0026	-0.21	0.000	0.0026	-0.19	-0.001	0.0026	-0.24
B/M ratio	-2.456	2.0838	-1.18	-2.594	2.0963	-1.24	-1.602	1.9421	-0.82
Profitability	**1.454**	0.7105	2.05	**1.717**	0.7265	2.36	**1.518**	0.6639	2.29
Leverage	0.002	0.0023	0.99	0.002	0.0024	0.83	0.002	0.0024	0.79
year and industry dummies	yes			yes			yes		
R^2	4.62%			4.44%			3.74%		
F	2.13 *			2.11 *			1.69 *		
Number of observations	1481			1481			1481		

R^2 in this model is 3.35 percent, substantially higher than in Models 2 and 5 in Table 3.5. This indicates that the additional information contained in the corporate-control dummy variables (and accounting variables) is quite valuable as it more than doubled the R^2.

Whereas in Panel A of Table 3.8 we test the effect of the presence of specific categories of blockholders, in Panel B we investigate the impact of the relative power of these categories of blockholders on CARs. We focus on the effect of the *dominant* blockholder type (as opposed to the effect of presence of a blockholder type regardless of

its relative size). A particular type of blockholder is dominant, if the sum of the shareholdings of this category is larger than that of any other category.[47] Since this set of dummy variables is mutually exclusive, only one dummy variable is equal to one at a time and the dummy variables for all the other categories are equal to zero. Once we have determined which specific category of shareholder dominates a firm, we also use interaction terms that indicate whether the other categories of owners are also among the firm's blockholders.[48]

We expect in Hypothesis 5a that the positive effect of directors' dealings is reduced when directors are the dominant blockholders as the directors may run the firm at the detriment of other blockholders and may become unaccountable due to their large share stakes. Panel B of Table 3.8 does not support this hypothesis as the parameter coefficient of dominant directors is not statistically significant. The fact that this finding is incongruous with that of Panel A may result from the fact that there are not so many firms in which directors are the dominant blockholders (this is only the case in 8 percent of firms).[49] Moreover, Panel B shows that when directors dominate and corporations are present as blockholders, the positive news of directors' purchases is offset. This finding fails to support Hypothesis 5b that predicts that the presence of a monitoring blockholder may balance the negative entrenchment effect of Hypothesis 5a.

Further, we also find, as expected in Hypothesis 3, that when individuals or families dominate, directors' purchases reveal less information to the market, but we find no such relation when corporations are the largest blockholder.

Panel B of Table 3.8 confirms that directors' purchases trigger positive CARs which are even higher when financial institutions are the dominant (or only) blockholder, confirming Hypothesis 4. As financial institutions may not be inclined to actively monitor the firm (see above), directors' dealings are powerful signals to the market and it may be

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[47] When we only consider the largest blockholder by category of owner (rather than the sum of the category's shareholdings), our results remain largely similar. This is due to the fact that in most companies, there is only one large blockholder within a specific category.

[48] We multiply the dominant blockholder dummy by the dummies for individual blockholder categories.

[49] Morck et al. (1988) indicate that the marginal entrenchment effect is decreasing as insider concentration and power increases. This may imply that the negative entrenchment effect embedded in directors' purchases is less prevailing once directors are strong and quite well entrenched, as in the case of dominant insider ownership. When insiders are the largest shareholder group, they may enjoy so much power and entrenchment that additional increase in their ownership does not have much more effect on entrenchment. The marginal entrenchment effect is very small.

that these financial institutions are trading on the directors' signal. The additional increase in CARs when financial institutions are present is offset when other categories of blockholders (corporations or directors) are also present. The reason is that outsider monitoring reduces the positive informational effect while the danger of managerial entrenchment provokes the same reaction.

Panel C of Table 3.8 tests Hypotheses 6 and 7 on the stronger market reaction to directors' purchases under poor performance and insolvency. Models 3-5 are similar to those in Panel A. However, they include additional regressors which are interaction terms between director categories and blockholder types on the one side and poor performance and/or financial distress on the other side. We measure poor performance and financial distress by dummy variables that are set to one if there are earnings losses (Model 3), low interest coverage (Model 4)[50] and decreased or omitted dividends (Model 5), respectively. These variables are expected to trigger more intensive shareholder or creditor monitoring (Franks et al., 2001).

Models 3 and 4 of Panel C reveal some interesting results: directors' purchases trigger positive share price reactions (constant), which are substantially higher when the company is generating losses or is financially distressed (see interaction terms of directors' types and losses/interest coverage). Thus, in situations of poor performance and insolvency, the market interprets directors' purchase transactions as confidence-building signals, which supports Hypothesis 6.

The parameter estimates of the blockholder dummies in Models 3-5 of Panel C are similar to those in Panel A, but the interaction terms of ownership concentration with poor performance (measured by earnings losses and dividend reductions) or with insolvency (low interest coverage) are not significant. The fact that in poorly performing companies with strong outsiders and directors, who could facilitate corporate recovery, the directors' signal is not stronger suggests that the market expects little from blockholders in making the firm profitable. It seems that in the case of poor performance, the signal of directors purchasing shares is important irrespective of the shareholder structure. This finding fails to support Hypothesis 7.

[50] The interest coverage becomes dangerously low when it falls below 2. At this stage a firm's bonds typically lose investment grade.

3.5.3.2 Ownership structure: sale transactions

Table 3.9 documents how ownership structure affects the market reaction to directors' sales. Panel A shows that the information content of sales is much lower than that of purchases. As stated in Hypothesis 1c, directors' sales are less informative as some of the sales by directors may be related to liquidity needs even though the firm's prospects remain favourable. Model 1 documents that the presence of specific categories of blockholders has little impact on the CARs at the sales announcement and the following day. The only type of blockholder that has an impact is directors. This positive effect is in line with Hypothesis 5a and may result from the fact that the danger of directors' entrenchment is reduced.

A more detailed account of the impact of different categories of blockholders is presented in Panel B of Table 3.9. We distinguish between dominant and non-dominant blockholders. Similar to the results from the purchases, these sales results support

TABLE 3.9: MARKET REACTION TO DIRECTORS' SALES AND OWNERSHIP STRUCTURE: CROSS-SECTIONAL REGRESSION RESULTS

All variables are as defined in Table 3.8. * denotes significance at 1% level. ** denotes significance at 5% level.

Panel A:	**Model 1**		
	coef.	std.dev.	t-stat.
constant	0.007	0.0052	1.27
other top executives	0.001	0.0043	0.15
chairmen	0.001	0.0024	0.43
other incumbent directors	0.001	0.0023	0.32
former directors	0.004	0.0027	1.48
concentrated blockholder			
corporations	-0.001	0.0032	-0.32
financial institutions	-0.002	0.0019	-0.99
individuals / families	-0.004	0.0027	-1.63
directors	**0.004**	0.0020	2.01
multiple sales	-0.004	0.0022	-1.61
size	**-0.002**	0.0007	-2.36
B/M ratio	-0.714	0.8903	-0.80
profitability	3.410	3.1194	1.09
leverage	0.348	0.4392	0.79
year and industry dummies	yes		
R^2	2.02%		
F	1.55 **		
number of observations	1681		

Table 3.9 continued

Panel B:	**Model 2**		
	coef.	std.dev.	t-stat.
constant	0.005	0.0051	0.99
other top executives	0.000	0.0043	-0.05
chairman	0.001	0.0024	0.49
other incumbent directors	0.001	0.0023	0.32
former directors	0.004	0.0027	1.59
dominant blockholder group			
dominant corporations	-0.003	0.0057	-0.57
with financial inst. present	0.007	0.0068	0.96
with indiv's/families present	0.020	0.0146	1.36
with directors present	-0.009	0.0086	-1.03
dominant financial institutions	**-0.004**	0.0023	-1.83
with corporation present	**-0.009**	0.0050	-1.82
with indiv's/families present	-0.005	0.0041	-1.21
with directors present	**0.005**	0.0027	1.97
dominant individuals/families	-0.008	0.0064	-1.24
with financial inst. present	**0.016**	0.0095	1.65
with directors present	-0.009	0.0107	-0.85
dominant directors	0.002	0.0034	0.61
with corporation present	0.010	0.0083	1.15
with financial inst. present	0.002	0.0040	0.42
with indiv's/families present	**-0.007**	0.0042	-1.69
multiple sales	-0.004	0.0022	-1.64
size	**-0.001**	0.0007	-2.01
B/M ratio	-0.880	0.9284	-0.95
profitability	3.710	3.2194	1.15
leverage	0.505	0.4724	1.07
year and industry dummies	yes		
R^2	3.30%		
F	1.57 **		
number of observations	1681		

Hypothesis 4: the presence of financial institutions reinforces the negative news conveyed by directors' sales. The reason is that financial institutions are not active monitors such that their presence does not reduce the asymmetry of information between directors and outsiders, nor does it reduce the potential agency conflicts between directors and outside blockholders. Instead, financial institutions may time their sales to closely follow directors' sales and thereby strengthen the negative news. The presence of directors in firms where financial institutions are dominant blockholders offsets the negative impact of the latter.

Table 3.9 continued

Panel C:	**Model 3 loss**			**Model 4 low int. coverage**			**Model 5 div. decrease**		
	coef.	std.dev.	t-stat.	coef.	std.dev.	t-stat.	coef.	std.dev.	t-stat.
constant	0.008	0.0051	1.54	0.008	0.0052	1.55	0.007	0.0049	1.46
former directors	0.002	0.0023	1.00	0.002	0.0023	0.96	0.004	0.0023	1.72
concentrated blockholder									
corporations	0.000	0.0038	0.09	-0.001	0.0038	-0.31	0.000	0.0031	-0.01
financial institutions	-0.001	0.0019	-0.70	-0.002	0.0019	-1.03	0.000	0.0019	-0.11
individuals / families	-0.002	0.0028	-0.79	-0.003	0.0027	-1.14	**-0.005**	0.0028	-1.70
directors	**0.004**	0.0020	1.96	**0.004**	0.0020	1.97	0.003	0.0020	1.54
interaction term: dir. category x performance dummy									
incumbent directors	**-0.038**	0.0123	-3.10	**-0.031**	0.0115	-2.71	-0.015	0.0161	-0.96
former directors	**0.031**	0.0127	2.41	**-0.023**	0.0116	-1.98	-0.018	0.0139	-1.27
interaction term: blockholder x performance dummy									
corporations	0.005	0.0084	0.61	0.009	0.0083	1.15	-0.010	0.0175	-0.59
financial institutions	**0.020**	0.0109	1.88	**0.019**	0.0099	1.88	-0.006	0.0131	-0.49
individuals / families	-0.010	0.0086	-1.18	-0.006	0.0085	-0.69	0.010	0.0101	0.98
directors	**0.015**	0.0077	1.93	0.009	0.0075	1.18	**0.021**	0.0116	1.84
dispersed	**0.041**	0.0129	3.16	**0.029**	0.0119	2.41	0.025	0.0161	1.53
multiple sales	**-0.004**	0.0020	-1.87	**-0.004**	0.0020	-1.91	**-0.004**	0.0021	-1.79
size	**-0.002**	0.0007	-2.34	**-0.002**	0.0008	-2.31	**-0.002**	0.0007	-2.36
B/M ratio	-0.663	0.9080	-0.73	-0.394	0.9034	-0.44	-0.642	0.9248	-0.69
profitability	2.666	2.7053	0.99	2.546	2.7889	0.91	3.418	3.0420	1.12
leverage	0.527	0.4408	1.19	0.448	0.4407	1.02	0.315	0.4506	0.70
year and industry dummies	yes			yes			yes		
R^2	3.32%			2.79%			3.03%		
F	1.94 *			1.61 **			1.62 **		
number of observations	1681			1681			1681		

We find strong support for Hypothesis 6 in Panel C of Table 3.9. The direct information effect of directors' sales is stronger for companies generating losses and having low interest coverage (as reflected in the interaction term of incumbent directors and losses/low interest coverage in Models 3 and 4). Models 3 and 5 show that in firms with directors with significant stakes, a reduction in directors' control levels attenuates the negative news of their sales even in the wake of poor performance (losses, dividend cuts). However, there is little consistent evidence that the control structure influences the market reaction to directors' sales (Models 3-5).

3.5.4 Other determinants of directors' trades

The results in Tables 3.5-3.9 also investigate the impact of firm size, transaction size and value, leverage, and book-to-market ratio on the market reaction to directors' share purchases and sales.

3.5.4.1 Firm size

We expect a negative correlation between the information content of directors' dealings and firm size. Since analysts tend to follow the larger firms more closely, it is likely that directors in small firms hold a more substantial informational advantage (Jeng et al., 1999 and Friederich et al., 2002). Empirical results concerning this conjecture are mixed. Seyhun (1986) reports a significant negative relationship between the announcement effects of directors' trades in the U.S. and corporate size. He concludes that most profitable directors' trading occurs in small firms. However, more recent studies do not support this finding and find no significant relation between market reactions and size (Lin and Howe, 1990 and Jeng et al., 1999). In particular, Jeng et al. argue that Seyhun's (1986) finding is a result of size-related measurement error in the abnormal returns. In other words, the relationship disappears once abnormal returns are size-adjusted. So far, no empirical evidence has been provided on this relation between firm size and CARs following the announcement of directors' trades for a U.K. sample. However, Gregory et al. (1997) report more director-trading activity for less liquid and smaller stocks that may indicate higher information asymmetry and larger CARs for these firms.

Our results in Table 3.8 show that for the case of directors' purchases the relationship between corporate size and informational advantage is negative but insignificant. Size is measured as the logarithm of the number of employees, but alternative measures such as the logarithm of the market capitalization or total assets are also statistically insignificant.

For directors' sales, we expect the parameter estimate of firm size to be positive (and to attenuate the negative overall market reaction) if the hypothesis that directors' dealings in smaller firms have a higher informational content is true. Our findings do not support this hypothesis and are mixed: the parameter estimate of the number of employees in Panels A and B of Table 3.9 is significantly negative (rather than positive) whereas those

of the market capitalization (Panel C, Table 3.9) and total assets (not reported) are insignificant. Thus, we can conclude that our results do not confirm that information asymmetry is more substantial in smaller firms. The reason why we find little relation between the market reaction to directors' trades and corporate size is that this result may be influenced by the fact that we only study the information content if larger transactions[51]. In general, larger trades may convey more information regardless of the firm size.

3.5.4.2 Intensity of trading

We also explore the notion that directors may be aware of their informational advantage and trade more when they have more information (Seyhun, 1986). To put it differently: more intensive insider trading can be interpreted as a signal of higher information asymmetry. There are two possible measures of the intensity of insider trading (Lin and Howe, 1990): the number of directors trading and the size of trades. Both measures are expected to have a positive effect on the abnormal returns.

Previous empirical results are mixed. Seyhun (1986) confirms the hypothesis: he documents that the market reaction to net insider transactions is significantly more positive for large trades (as measured by the (log-) value (in dollars) and the (log-) proportion of the firm traded). The net number of trading directors, however, becomes insignificant after controlling for firm size.[52] Jeng et al. (1999) confirm Seyhun's results and show that medium-volume and high-volume insider purchases are more profitable compared to low-volume purchases[53], but the profitability of the medium and high-volume portfolios is very comparable. In contrast, Lin and Howe (1990) do not support the hypothesis: neither the number of directors who are trading nor the dollar amount of insider trading are important determinants of the CARs measured over the 6 and 12 months following the insider transaction. For a U.K. sample of mid-cap firms, Friederich et al. (2002) report that clustered (repeated) buys and sells are associated with CAARs that

[51] For a discussion about the relative versus absolute transaction size: see next section.
[52] The net number of insiders is defined as the absolute value of the difference between the number of buyers and the number of sellers.
[53] The portfolios are partitioned according to the fraction of equity traded.

are substantially higher than the full sample of insider buys and sells: CAARs 20 days after the clustered purchases are 4.5 percent compared to 1.9 percent for all purchases. For sales, the corresponding CAARs equal to –2.4 and –1.5 percent for the clustered and full sample, respectively. Furthermore, this study reports that medium-sized buys (between GBP 5,000 and 70,000) predict higher 20-day CAARs than large buys. Insider sales do not trigger a similar relationship.

Our results are mixed. First, the fact that multiple directors are trading proves to be a significant determinant of the information content for purchases and sales in Tables 3.4 and 3.5. The market price response is markedly larger when more than one director purchases the shares of his own firm (Table 3.4). On average, abnormal returns are 1.4 percent higher when two or more directors purchase on the same day. This finding is not surprising as our analysis includes only those transactions that represent more than 0.1 percent of company's market capitalization. Two or more such dealings on the same day emit a strong signal. We find similar strong (negative) results for repeated directors' sales in Table 3.5. Tables 3.6 and 3.7, however, reveal that after controlling for ownership structure (and accounting variables), the significance of these results is diminished.

Second, we measure the effect of the size of directors' transactions using a relative and an absolute benchmark: the fraction of the market capitalization traded and the total net value of the transaction. The former proxy indicates that transaction size mitigates abnormal returns (Tables 3.5 and 3.7): the higher the relative share in the company that is sold or purchased by a director, the lower is the information content. This is at first sight surprising but a more detailed analysis (using piecewise regressions[54]) shows that relatively larger purchases (sales) trigger stronger positive (negative) market reactions up to a certain level of shareholding. When directors purchase very large shareholdings (20 percent or more of the shares outstanding), the market reacts with strongly negative (positive) share price adjustments.[55] Thus, whereas purchases are perceived to be a positive signal in general, very large purchases which give substantial control to directors raise substantial fears of entrenchment. Likewise, increased share liquidity and reduced domination of the firm in terms of control by directors lead to increases in announcement

[54] Not shown: tables available upon request.
[55] Results are not shown in the tables but are available upon request.

CARs for sales. Friederich et al. (2002) report similar finding that mid-sized purchases trigger the largest CAAR. In Tables 3.8 and 3.9, we re-estimate the models with an absolute measure of transaction size (the logarithm of total net value traded) and find results (although somewhat less significant) similar to those found for the relative transaction size measures.

As a last step, we investigate whether the information content of the transaction size depends on the identity of the directors trading. To do this, we construct an interaction term consisting of the transaction size (measured by the fraction of market capitalization traded) and the director-category dummies. The results reported in Panel C of Tables 3.5 and 3.7 indicate that the relationship varies by category of directors. For purchases (Table 3.5), the transaction size does not matter when the CEO or chairman is buying additional shares, whereas it does for other top executives and former directors. It is these last two categories that trade the large shareholdings (20 percent or more) referred to above. It is only for the category of other incumbent directors that the correlation between share stake and CARs is positive. We conjecture that the positive correlation arises due to the fact that (i) for this category there are few very large transactions and (ii) other incumbent directors consist largely of non-executive directors who have fewer opportunities to take advantage of private benefits than top executives. For sales (Table 3.7), the negative information content of other incumbent directors is mitigated as the transaction size increases.

In summary, our results indicate that the market responds to the signal that several directors trade while the transaction size is of lesser importance. In fact, medium-sized purchases and sales trigger the strongest market reaction. In the case of very large sales (or purchases), the market interprets the reduction (increase) in potential entrenchment as good (bad) news.

3.5.4.3 Leverage and book-to-market ratio

Firm leverage may also have an important impact on (the market response to) directors' dealings as leverage is a corporate governance mechanism which reduces the free cash flow available to managers. Furthermore, leverage can also be interpreted as a measure of (past and incumbent) financial performance as continuing poor performance erodes the equity base and leads to a higher debt-equity ratio. Still, in our models the

effect of leverage (measured by the debt/equity and debt/total assets ratios in the year prior to the directors' transactions) is not statistically significant.

Jenter (2001) documents that high book-to-market (value) firms are regarded as undervalued by their managers relative to low book-to-market (growth) firms. Managers tend to purchase shares in value firms and sell shares in growth firms. This is also illustrated by the summary statistics in Table 3.1: the average book-to-market ratio for the purchase sample is considerably higher relative to the sales sample. This indicates that directors have better information regarding the true value of their firms and this information motivates them to trade.

We conjecture that it may be the case that the information content of purchases and sales for value firms differs from that for growth firms. In general, the coefficient on the book-to-market ratio is negative for purchases and sales (Tables 3.6 and 3.7). This indicates that market reaction to purchases is the highest for growth firms. This book-to-market effect may be explained by the fact that the informational asymmetry is larger for firms with a high fraction of intangible assets (low book-to-market ratio). Alternatively, the overoptimistic market sentiment of the 1990s may have strengthened the strong positive market reactions to positive directors' signals in growth firms. For sales, the book-to-market ratio triggers the opposite effect: the information content is the highest for high book-to-market firms, but the coefficient is not significant.

We have also repeated our analysis for different time periods (e.g. 1991-94 and 1995-98) to check the consistency of our results (not reported) and can conclude that the results remain significant.

Our conclusions also do not change when we replace the ownership dummy variables with continuous measures of ownership by categories of blockholder. Moreover, piecewise ownership variables indicate that the economic effect with different degrees of ownership concentration remains the same.

3.6 Conclusions

The main contribution of this chapter is the analysis of the impact of corporate control on the information content of directors' trading measured by two-day CARs on the

announcement day and the following day. There are several important conclusions that emerge from our research.

First, we find that both directors' purchases and sales trigger significant CAARs: 3.12 percent and –0.37 percent, respectively. The market reaction to purchases is higher though. Markets seem to discount the information content of sales more as part of the directors' sales may be caused by liquidity and diversification needs. This leads to confirmation of Hypotheses 1a, 1b, and 1c.

Second, we do not support the information hierarchy hypothesis (Hypothesis 2). Although CEOs are assumed to have the best knowledge about their companies' prospects, we find that the information content of CEO purchases and sales is lower than that of other director categories. Moreover, we report that when former directors purchase shares of their former companies, the market reaction at the announcement of this trade is larger than that associated with the purchases by other categories of directors. In contrast, the CAAR for former directors' sales is insignificant, presumably as the market considers such transactions as motivated by reasons of wealth diversification.

Third, we find a strong relation between the presence of specific categories of blockholders and the price reaction to the directors' transactions. It is important to distinguish (i) between directors and outsiders and (ii) between blockholders who monitor the management and those who do not. As before, the results for purchases are stronger than for sales transactions. If corporations, or individuals or families unrelated to the management are blockholders, then the CARs are reduced. This suggests that these categories of blockholders provide monitoring and reduce informational asymmetry. In contrast, the presence of institutional investors triggers the reverse effect as the CARs are more positive (negative) following directors' purchases (sales) when institutional investors are blockholders. This suggests that institutions do not reduce the information gap between investors and directors, but that they follow directors' trades.

Fourth, our results confirm that markets react to a possible increase or decrease in directors' entrenchment. Generally, increases in directors' ownership are recognized as a negative signal, whereas decreases are perceived as positive news.

Fifth, we find stronger market reactions in situations of high uncertainty: when the firm is performing poorly (making losses or decreases its dividends) or is close to financial

distress (low interest coverage). Neither firm size nor leverage influence the abnormal returns of the announcement of directors' transactions.

Sixth, our results also document that the market reacts more strongly when more than one director purchases or sells. In contrast, transaction size has no significant impact on the CARs. This may be due to the fact that our sample includes only the larger transactions.

A natural extension of this study will explore the long-term performance of directors' dealings and will relate it to the corporate control structures of the firms. In the present study, we document that the market reacts fast to the new information contained in directors' purchases and sales: the immediate market reaction to directors' trades is economically and statistically significant. The extension will complement this short-term approach with a long-term analysis. Even though both short- and long-term approaches have been used quite extensively in the literature, not many studies have used the two methods simultaneously to document the information revelation process in the market. One of the few exceptions is Lakonishok and Lee (2001). Their findings, however, indicate insignificant short-term price reaction, which is in contrast with our findings in the present study. The extended analysis could provide further evidence on the information revelation process in the financial markets and reveal whether market incorporates the information contained in directors' transactions immediately and fully or whether stocks picked up by corporate directors outperform the market over longer periods. Furthermore, the analysis would provide further evidence on the corporate-control determinants of information content of directors' transactions. The long-term performance measure developed by Eckbo and Smith (1998) that extends the traditional event study technique to a conditional, weighted, multifactor setting is a suitable performance measure.

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Appendices

APPENDIX 1: ALL DISCLOSURES REPORTING CHANGES IN EQUITY POSITIONS TO THE LONDON STOCK EXCHANGE.

This table shows the descriptive statistics of various types of changes in equity position by directors of companies that are listed on the London Stock Exchange over the period 1991 through 1998. For each share type, the table lists *the absolute number of shares traded* and *the relative size of the trades* (defined as number of shares traded divided by number of shares outstanding in a given year).

The share type groups are defined as follows: *Ordinary voting shares* include ordinary shares, ADR, ADR A, Common Stock, Consolidated ordinary, Fully paid, and Ordinary A. *Ordinary non-voting shares* include Limited voting, Limited voting A, Non-voting A, Non-voting ordinary, Pref A, Preference, Restricted voting, Restricted voting A. *Options voting* include Options, Options A shares, Options call. *Options non-voting* include Options A restricted voting, Options limited voting A, Options non-voting A. *Convertible debt* includes Convertible bonds, Convertible capital bonds, Convertible cum. redeemed preferred nil paid, and Exchangeable bonds. *Convertible preferred* include Convertible cum. preferred, Convertible cum. redeemed preferred, Convertible non-voting, Convertible preferred, Convertible preferred A, Deferred convertible non-voting. *Rights* refer just to one category. *Warrants* include Warrants and Warrants A.

Share type	# of observations	Fraction of # of obs.	Mean	Std. Dev.	p25%	Median	p75%	Min	Max	Skewness	Kurtosis	# of firms
all transactions	35439	100%	108,894	1,077,388	3,000	11,000	50,000	1	143,000,000	83.24	9668.86	1498
			0.22%	1.21%	0.00%	0.02%	0.09%	0.00%	61.44%	18.44	513.93	
ordinary - voting	27416	77.36%	105,857	1,182,680	2,500	10,000	44,430	1	143,000,000	80.17	8577.44	1488
			0.23%	1.21%	0.00%	0.02%	0.09%	0.00%	41.41%	15.76	340.54	
ordinary - non-voting	330	0.93%	41,600	222,856	2,061	6,000	24,250	1	3,437,500	12.28	173.39	63
			0.24%	0.71%	0.01%	0.03%	0.23%	0.00%	9.61%	8.88	103.70	
options - voting	5885	16.61%	95,284	273,699	9,031	36,400	97,000	10	10,000,000	19.97	635.66	845
			0.14%	0.44%	0.00%	0.03%	0.11%	0.00%	12.79%	12.05	240.92	
options - non-voting	15	0.04%	29,959	39,153	4,054	25,000	40,000	1,621	156,405	2.38	8.44	7
			0.22%	0.42%	0.01%	0.03%	0.12%	0.00%	1.29%	1.90	4.97	
convertible debt	6	0.02%	155,180	188,547	20,000	96,688	208,413	10,000	499,288	1.08	2.87	4
			0.05%	0.05%	0.02%	0.03%	0.06%	0.00%	0.13%	1.19	3.14	
convertible preferred	100	0.28%	127,573	216,701	7,165	25,000	200,000	335	1,222,943	3.07	14.45	43
			0.36%	0.65%	0.01%	0.04%	0.53%	0.00%	3.10%	2.64	10.09	
rights	891	2.51%	125,339	589,393	1,501	5,643	30,000	1	8,181,984	9.14	101.61	182
			0.31%	1.96%	0.00%	0.01%	0.04%	0.00%	35.12%	11.89	172.19	
warrants	96	0.27%	531,663	1,292,980	7,558	27,800	422,500	15	7,200,000	3.38	14.39	36
			0.80%	2.06%	0.01%	0.08%	0.62%	0.00%	12.61%	4.35	23.80	
remaining groups	700	1.98%	293,683	1,611,269	2,622	15,236	94,773	4	35,600,000	16.31	337.25	212
			0.56%	3.01%	0.00%	0.02%	0.17%	0.00%	61.44%	15.19	278.13	

APPENDIX 2: DISTRIBUTION OF REPORTED DEALINGS OVER TRANSACTION TYPES.

This table shows the descriptive statistics by transaction type of the most populated share type groups of directors' dealings. It is based on a data set that captures all changes in equity position by directors of U.K. companies that are listed on the London Stock Exchange over the period from 1991 through 1998. For each share type and transaction type, the table *lists the absolute number of shares traded* and *the relative size of the trades* (defined as number of shares traded divided by number of shares outstanding in a given year).

The share type groups are defined as follows: *Ordinary voting shares* in *Panel A* include Ordinary shares, ADR, ADR A, Common Stock, Consolidated ordinary, Fully paid, and Ordinary A. *Ordinary non-voting shares* in *Panel B* include Limited voting, Limited voting A, Non-voting A, Non-voting ordinary, Pref A, Preference, Restricted voting, and Restricted voting A. *Options voting* in *Panel C* include Options, Options A shares, and Options call. *Convertible preferred* in *Panel D* include Convertible cum. preferred, Convertible cum. redeemed preferred, Convertible non-voting, Convertible preferred, Convertible preferred A, and Deferred convertible non-voting. *Rights* in *Panel E* refer just to one category.

Transaction type	# of observations	Fraction of # of obs.	Mean	Std. Dev.	p25%	Median	p75%	Min	Max	Skewness	Kurtosis	# of firms
Panel A: Ordinary voting shares												
buy	14500	52.89%	62,696	543,495	2,000	6,069	21,255	1	36,300,000	42.86	2468.73	1385
			0.16%	1.16%	0.00%	0.01%	0.06%	0.00%	41.41%	20.35	517.81	
sell	6769	24.69%	228,789	2,229,698	5,000	17,850	100,000	1	143,000,000	46.97	2721.58	1119
			0.47%	1.61%	0.01%	0.05%	0.27%	0.00%	33.33%	9.01	114.85	
sale post exercise	3876	14.14%	93,143	201,757	17,000	42,101	98,960	3	6,000,000	11.18	233.67	690
			0.11%	0.30%	0.01%	0.03%	0.10%	0.00%	6.49%	8.89	123.67	
script dividend	1441	5.26%	4,469	50,942	29	100	371	1	1,186,412	18.96	397.80	164
			0.01%	0.09%	0.00%	0.00%	0.00%	0.00%	2.44%	19.59	452.62	
remaining groups	830	3.02%										
Panel B: Options												
exercise	5796	98.49%	95,178	275,012	9,000	36,180	95,919	10	10,000,000	19.98	633.18	837
			0.14%	0.44%	0.00%	0.03%	0.11%	0.00%	12.79%	12.08	241.17	
remaining groups	89	1.51%										
Panel C: Rights												
take up	854	95.85%	126,093	600,144	1,500	5,504	27,932	1	8,181,984	9.02	98.58	175
			0.31%	1.99%	0.00%	0.01%	0.04%	0.00%	35.12%	11.85	169.64	
remaining groups	37	4.15%										

APPENDIX 3: SIZE INTERVALS FOR DIRECTORS' DEALINGS.

This table shows the descriptive statistics of directors' purchases, sales and sales post exercise of ordinary voting shares, exercise of voting options, and rights taken up. Each of the panels shows distribution of a particular transaction type (e.g. purchases, sales) according to the relative size of transactions. It is based on a data set that captures all changes in equity positions by directors of U.K. companies that are listed on the London Stock Exchange over the period from 1991 through 1998. For each transaction type and size interval, the table lists the absolute number of shares traded and the relative size of the trades (defined as number of shares traded divided by number of shares outstanding in a given year). Ordinary voting shares include Ordinary shares, ADR, ADR A, Common Stock, Consolidated ordinary, Fully paid, and Ordinary A. Voting options include Options, Options A shares, and Options call.

Interval	# of observations	Fraction of # of obs.	Mean	Std. Dev.	p25%	Median	p75%	Min	Max	Skewness	Kurtosis	# of firms
PANEL A: PURCHASES												
up to 0.1%	12019	82.89%	12,607	30,525	1,388	5,000	10,000	1	1,000,000	10.67	207.68	1273
			0.02%	0.02%	0.00%	0.01%	0.03%	0.00%	0.10%	1.65	4.91	
0.1% to 0.5%	1834	12.65%	111,898	228,790	22,025	50,000	100,000	500	4,425,000	8.28	109.53	633
			0.22%	0.10%	0.13%	0.19%	0.28%	0.10%	0.50%	0.92	2.82	
0.5% to 1%	322	2.22%	324,822	626,125	78,000	150,000	300,000	3,000	7,000,000	6.27	55.30	197
			0.70%	0.14%	0.57%	0.67%	0.81%	0.50%	1.00%	0.47	2.02	
1% to 2%	150	1.03%	614,532	856,025	150,000	318,325	700,000	5,000	5,256,666	3.14	14.83	119
			1.42%	0.28%	1.18%	1.37%	1.63%	1.00%	1.97%	0.30	1.90	
2% to 3%	57	0.39%	761,631	818,975	160,000	506,103	1,000,000	15,000	3,639,673	1.73	5.66	46
			2.45%	0.31%	2.17%	2.43%	2.80%	2.00%	2.98%	0.25	1.67	
3% to 5%	52	0.36%	1,437,146	1,499,952	500,000	1,000,000	1,873,132	50,000	8,169,250	2.49	10.54	42
			3.76%	0.63%	3.19%	3.48%	4.23%	3.01%	5.00%	0.55	1.96	
5% to 10%	31	0.21%	3,696,297	8,505,633	355,000	1,333,333	2,224,000	28,660	36,300,000	3.28	12.32	25
			7.17%	1.29%	6.08%	7.02%	8.21%	5.23%	9.91%	0.26	2.20	
10% to 15%	12	0.08%	5,018,795	6,007,573	1,450,850	2,643,783	5,435,000	50,000	17,800,000	1.50	3.67	10
			11.31%	1.49%	10.29%	10.47%	12.47%	10.06%	14.66%	1.10	2.97	
15% to 20%	7	0.05%	2,029,082	1,795,760	885,500	1,500,000	3,318,077	250,000	5,500,000	1.12	2.99	6
			16.43%	1.54%	15.00%	16.07%	17.05%	15.00%	19.47%	1.10	3.25	
20% to 25%	8	0.06%	3,109,752	3,270,047	365,330	2,755,360	4,240,462	179,568	9,976,145	1.13	3.45	8
			22.65%	1.60%	21.10%	22.86%	23.92%	20.55%	24.90%	-0.05	1.57	
25% and more	8	0.06%	2,941,761	1,948,763	1,335,541	2,927,778	4,490,984	299,999	5,725,484	0.09	1.61	6
			33.07%	5.19%	30.08%	31.49%	37.27%	25.50%	41.41%	0.29	2.08	

Appendix 3 continued

Interval	# of observations	Fraction of # of obs.	Mean	Std. Dev.	p25%	Median	p75%	Min	Max	Skewness	Kurtosis	# of firms
PANEL B: SALES												
up to 0.1%	4101	60.59%	19,603	56,449	3,000	6,680	15,400	1	1,000,000	9.91	130.94	829
			0.02%	0.03%	0.00%	0.01%	0.04%	0.00%	0.10%	1.18	3.35	
0.1% to 0.5%	1518	22.43%	140,815	319,541	25,000	50,745	122,000	2,500	5,000,000	7.97	89.87	566
			0.24%	0.11%	0.15%	0.21%	0.32%	0.10%	0.50%	0.67	2.32	
0.5% to 1%	486	7.18%	349,677	520,738	88,140	200,000	360,000	2,500	4,500,000	3.95	23.56	292
			0.71%	0.15%	0.58%	0.69%	0.82%	0.50%	1.00%	0.34	1.87	
1% to 2%	305	4.51%	561,704	777,527	161,600	300,000	622,875	20,000	5,500,000	3.63	18.50	203
			1.42%	0.27%	1.18%	1.39%	1.65%	1.00%	2.00%	0.23	1.92	
2% to 3%	130	1.92%	904,854	1,506,023	285,175	451,540	1,000,000	17,000	10,000,000	4.55	25.69	103
			2.44%	0.29%	2.20%	2.42%	2.66%	2.00%	3.00%	0.24	1.94	
3% to 5%	118	1.74%	1,498,747	1,706,171	500,000	929,715	2,000,000	100,000	10,000,000	2.72	12.32	99
			3.82%	0.53%	3.34%	3.76%	4.27%	3.00%	4.82%	0.13	1.75	
5% to 10%	70	1.03%	2,855,704	5,239,976	550,000	1,128,642	2,500,000	50,000	38,000,000	4.80	30.71	55
			6.92%	1.42%	5.43%	6.91%	8.07%	5.00%	9.97%	0.30	2.00	
10% to 15%	21	0.31%	6,688,379	15,000,000	1,600,000	2,448,208	4,462,837	600,000	69,300,000	3.73	15.88	20
			12.02%	1.48%	10.82%	11.72%	12.90%	10.08%	15.00%	0.60	2.19	
15% to 20%	10	0.15%	19,200,000	44,200,000	885,500	2,780,531	13,900,000	700,000	143,000,000	2.55	7.74	10
			16.66%	1.56%	15.12%	16.19%	17.86%	15.00%	19.27%	0.40	1.70	
20% to 25%	7	0.10%	11,500,000	19,100,000	1,975,720	5,432,071	7,945,000	896,282	54,500,000	1.97	5.02	7
			22.57%	1.77%	20.34%	23.50%	23.86%	20.10%	24.54%	-0.46	1.60	
25% and more	3	0.04%	1,815,727	1,435,248	219,568	2,227,613	3,000,000	219,568	3,000,000	-0.48	1.50	3
			29.25%	4.11%	25.11%	29.31%	33.33%	25.11%	33.33%	-0.03	1.50	

Appendix 3 continued

Interval	# of obs.	% # of obs.	Mean	Std. Dev.	p25%	Median	p75%	Min	Max	Skewness	Kurtosis	# of firms
PANEL C: SALES POST EXERCISE												
up to 0.1%	2904	74.92%	66,984	121,830	13,039	34,253	74,059	3	2,452,676	8.28	117.04	500
			0.03%	0.03%	0.00%	0.02%	0.04%	0.00%	0.10%	1.09	3.11	
0.1% to 0.5%	782	20.18%	126,110	210,886	30,000	68,029	136,901	1,500	3,176,200	6.71	74.34	374
			0.21%	0.10%	0.13%	0.18%	0.26%	0.10%	0.50%	1.07	3.21	
0.5% to 1%	128	3.30%	256,658	272,800	77,500	149,750	325,072	19,600	1,430,281	1.99	6.97	97
			0.68%	0.12%	0.58%	0.66%	0.77%	0.50%	0.98%	0.55	2.35	
1% to 2%	47	1.21%	492,327	977,730	100,000	150,000	400,015	22,000	6,000,000	4.20	22.87	37
			1.37%	0.28%	1.15%	1.24%	1.59%	1.00%	1.90%	0.64	2.05	
2% to 3%	6	0.15%	574,425	712,705	195,000	290,000	525,000	146,552	2,000,000	1.64	3.91	6
			2.21%	0.08%	2.12%	2.23%	2.27%	2.12%	2.31%	-0.28	1.56	
3% to 5%	8	0.21%	936,343	583,718	462,500	905,000	1,512,750	127,741	1,602,500	-0.18	1.65	6
			3.94%	0.54%	3.59%	4.00%	4.26%	3.06%	4.80%	-0.16	2.33	
5% and more	1	0.03%	951,778	.	951,778	951,778	951,778	951,778	951,778	.	.	1
			6.49%	.	6.49%	6.49%	6.49%	6.49%	6.49%	.	.	
PANEL D: EXERCISE OF VOTING OPTIONS												
up to 0.1%	4232	73.02%	57,177	116,180	5,431	22,453	63,000	10	2,452,676	8.20	118.82	578
			0.02%	0.03%	0.00%	0.01%	0.03%	0.00%	0.10%	1.28	3.57	
0.1% to 0.5%	1184	20.43%	133,517	220,535	35,000	70,000	150,000	1,500	3,216,200	5.98	56.52	494
			0.22%	0.10%	0.14%	0.19%	0.29%	0.10%	0.50%	0.82	2.61	
0.5% to 1%	236	4.07%	290,046	388,872	80,000	149,750	327,779	6,050	3,536,570	3.74	24.61	155
			0.69%	0.13%	0.58%	0.68%	0.79%	0.50%	1.00%	0.47	2.18	
1% to 2%	102	1.76%	468,440	1,162,655	120,000	193,507	437,442	39,180	10,000,000	6.61	50.39	77
			1.35%	0.27%	1.14%	1.26%	1.54%	1.00%	1.90%	0.71	2.37	
2% to 3%	19	0.33%	600,727	655,102	150,000	215,659	1,000,000	45,552	2,000,000	1.11	2.75	18
			2.38%	0.21%	2.27%	2.33%	2.45%	2.06%	2.90%	1.00	3.75	
3% to 5%	16	0.28%	613,281	382,296	338,994	501,170	950,000	123,412	1,423,000	0.56	2.25	14
			3.90%	0.53%	3.42%	3.93%	4.33%	3.12%	4.73%	0.08	1.72	
5% to 10%	5	0.09%	626,714	534,985	400,000	450,000	690,000	89,552	1,504,018	0.92	2.59	5
			6.33%	1.66%	5.15%	5.47%	7.09%	5.03%	8.91%	0.80	2.05	
10% and more	2	0.03%	5,500,000	6,363,961	1,000,000	5,500,000	10,000,000	1,000,000	10,000,000	0.00	1.00	2
			11.58%	1.72%	10.37%	11.58%	12.79%	10.37%	12.79%	0.00	1.00	

Appendix 3 continued

Interval	# of observations	Fraction of # of obs.	Mean	Std. Dev.	p25%	Median	p75%	Min	Max	Skewness	Kurtosis	# of firms
PANEL E: RIGHTS TAKEN UP												
up to 0.1%	696	81.50%	11,925	32,241	1,142	3,671	9,654	1	609,522	10.76	177.18	158
			0.01%	0.02%	0.00%	0.00%	0.01%	0.00%	0.10%	2.66	10.55	
0.1% to 0.5%	93	10.89%	164,451	251,540	40,931	75,725	180,000	12,436	1,582,666	3.69	18.28	57
			0.23%	0.09%	0.15%	0.21%	0.28%	0.10%	0.47%	0.86	2.94	
0.5% to 1%	27	3.16%	449,242	590,481	125,000	254,169	428,892	62,515	2,660,131	2.42	8.69	17
			0.65%	0.12%	0.54%	0.62%	0.76%	0.51%	0.88%	0.56	1.96	
1% to 2%	16	1.87%	1,513,483	1,613,483	468,438	1,357,899	1,910,660	179,300	7,000,000	2.57	9.62	13
			1.38%	0.29%	1.20%	1.33%	1.49%	1.02%	1.98%	0.94	3.05	
2% to 3%	7	0.82%	791,190	1,316,526	236,000	246,000	560,000	229,025	3,764,602	2.01	5.09	4
			2.43%	0.11%	2.36%	2.40%	2.46%	2.35%	2.66%	1.54	4.03	
3% to 5%	3	0.35%	952,869	477,123	406,994	1,161,290	1,290,322	406,994	1,290,322	-0.65	1.50	2
			3.76%	0.41%	3.35%	3.76%	4.18%	3.35%	4.18%	0.01	1.50	
5% to 10%	5	0.59%	3,510,853	3,223,397	1,058,050	2,432,979	5,381,250	500,000	8,181,984	0.54	1.76	5
			7.46%	1.99%	5.42%	8.44%	8.83%	5.21%	9.39%	-0.32	1.23	
10% to 15%	3	0.35%	1,786,736	582,509	1,220,983	1,754,558	2,384,667	1,220,983	2,384,667	0.10	1.50	3
			12.06%	1.97%	10.05%	12.14%	13.99%	10.05%	13.99%	-0.07	1.50	
15% to 20%	2	0.23%	3,891,766	3,012,693	1,761,470	3,891,766	6,022,061	1,761,470	6,022,061	0.00	1.00	2
			17.26%	1.38%	16.28%	17.26%	18.23%	16.28%	18.23%	0.00	1.00	
20% to 25%	1	0.12%	1,750,000	.	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	.	.	1
			27.26%	.	27.26%	27.26%	27.26%	27.26%	27.26%	.	.	
25% and more	1	0.12%	6,898,940	.	6,898,940	6,898,940	6,898,940	6,898,940	6,898,940	.	.	1
			35.12%	.	35.12%	35.12%	35.12%	35.12%	35.12%	.	.	

APPENDIX 4: SUMMARY STATISTICS IN LINE WITH LAKONISHOK AND LEE (2001).

These tables report summary statistics of director dealings for all ordinary voting shares and options listed on the London Stock Exchange. The panels were constructed in order to compare dealings of U.K. directors to dealings of their U.S. counterparts summarized in Tables 1 and 2 of Lakonishok and Lee (2001). *'Fraction'* refers to the average annual fraction of firms with at least one director trade of each type among all firms listed on the LSE. *'# of trades'* is the average annual number of trades per company, defined as the average of the number of total director transactions divided by number of years listed on the LSE during our estimation window (1991-98). Companies with no director trades are also included. The conditional # of trades considers only companies with at least one directors' trade during 1991-98. *'Total shares transacted – per firm'* refers to the average annual number of shares transacted per company, defined as the total number of shares transacted divided by number of years listed on the LSE during 1991-98. The conditional average considers only companies with at least one directors' trade during 1991-98. *'% mkt cap'* is the average ratio of the total annual individual company's number of shares transacted to the total number of shares outstanding of the corresponding company at the end of each year. The conditional variable considers only companies with at least one directors' trade. *'# of firms'* refers to the number of firms with at least one share traded of the respective category during 1991-98. *'All'* includes purchases, sales and sales directly after an exercise of all ordinary voting shares plus exercise of all voting options.

Panel A	all	purchases	sales	sales post exercise	sales & sales post exercise	exercise
fraction	0.71	0.51	0.33	0.17	0.50	0.24
# of trades	4.26	1.49	0.69	0.40	1.09	0.59
- conditional	5.96	2.90	2.13	2.29	4.42	2.49
total shares transacted per firm	349,666	93,129	163,036	36,985	200,022	56,515
- conditional	489,409	181,810	500,919	213,369	714,288	236,760
% mkt cap – cond.	0.69%	0.24%	0.46%	0.09%	0.48%	0.14%
# of firms	1492	1385	1119	690	1203	837
Panel B						
1991 total shares transacted						
- per firm	305,405	47,928	180,180	29,369		47,297
- per firm, conditional	500,739	125,472	550,964	203,750		266,497
% mkt cap - conditional	1.07%	0.43%	1.17%	0.22%		0.40%
1992 total shares transacted						
- per firm	196,190	71,619	66,286	22,381		35,905
- per firm, conditional	293,030	148,323	216,822	179,389		198,421
% mkt cap - conditional	0.80%	0.52%	0.70%	0.20%		0.27%
1993 total shares transacted						
- per firm	276,511	73,166	116,876	35,063		51,216
- per firm, conditional	379,896	159,091	305,970	168,493		207,308
% mkt cap - conditional	0.94%	0.41%	0.93%	0.26%		0.34%
1994 total shares transacted						
- per firm	255,008	86,686	109,409	21,293		37,452
- per firm, conditional	343,148	160,436	328,283	113,964		150,847
% mkt cap - conditional	0.99%	0.53%	0.99%	0.21%		0.32%
1995 total shares transacted						
- per firm	465,889	149,496	190,627	52,996		73,008
- per firm, conditional	599,796	261,050	533,186	241,007		258,543
% mkt cap - conditional	0.96%	0.41%	1.03%	0.24%		0.32%
1996 total shares transacted						
- per firm	542,986	109,784	298,939	56,301		78,629
- per firm, conditional	704,524	196,809	820,774	265,385		272,494
% mkt cap - conditional	1.17%	0.63%	1.03%	0.29%		0.40%
1997 total shares transacted						
- per firm	386,788	84,021	183,254	43,315		76,054
- per firm, conditional	510,029	144,819	591,121	258,874		290,055
% mkt cap - conditional	0.96%	0.31%	1.17%	0.41%		0.44%
1998 total shares transacted						
- per firm	275,665	108,219	94,326	29,321		44,019
- per firm, conditional	429,875	222,222	398,148	243,030		215,000
% mkt cap - conditional	0.78%	0.45%	0.84%	0.20%		0.28%

APPENDIX 5A: OWNERSHIP STRUCTURE OF U.K. COMPANIES.

	1992	1993	1994	1995	1996	1997	1998	All years
Panel A: Ownership stake of the largest shareholder								
Mean	0.212	0.216	0.214	0.212	0.206	0.205	0.207	0.210
Median	0.151	0.156	0.153	0.151	0.159	0.159	0.153	0.155
Std. Dev	0.162	0.159	0.155	0.153	0.144	0.142	0.146	0.151
Min	0.050	0.050	0.050	0.050	0.050	0.050	0.051	0.050
Max	0.898	0.898	0.899	0.899	0.899	0.899	0.899	0.899
Panel B: Cumulative ownership stake of all large shareholders (owing 5% and more)								
Mean	0.404	0.394	0.388	0.388	0.379	0.377	0.391	0.394
Median	0.385	0.380	0.375	0.378	0.374	0.360	0.384	0.379
Std. Dev	0.206	0.202	0.200	0.190	0.182	0.188	0.186	0.199
Min	0.050	0.050	0.050	0.050	0.050	0.050	0.051	0.050
Max	0.988	0.993	0.978	0.938	0.985	0.985	0.899	0.993
Panel C: Herfindahl index of all reported ownership stakes								
Mean	0.092	0.091	0.089	0.087	0.081	0.080	0.084	0.086
Median	0.046	0.047	0.047	0.046	0.046	0.046	0.045	0.046
Std. Dev	0.120	0.117	0.110	0.110	0.100	0.099	0.101	0.108
Min	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Max	0.806	0.806	0.808	0.808	0.808	0.808	0.808	0.808

APPENDIX 5B: CATEGORIES OF SHAREHOLDERS – CONDITIONAL STATISTICS.

	# of obs.	Mean	St. Dev.	Min	Q25%	Median	Q75%	Max	Skew.	Kurt.
Panel A: Sum of all equity stakes										
Institutions	5631	0.203	0.167	0	0.066	0.177	0.305	0.954	0.89	3.69
Banks	5631	0.018	0.052	0	0	0	0	0.954	4.88	42.64
Invest./pension funds	5631	0.159	0.156	0	0	0.126	0.246	0.899	1.27	4.93
Insurance co's	5631	0.025	0.047	0	0	0	0.052	0.358	2.22	8.56
Real estate co's	5631	0.001	0.017	0	0	0	0	0.520	18.09	428.55
Corporations	5631	0.044	0.118	0	0	0	0	0.929	3.53	16.73
Individuals/Families	5631	0.025	0.068	0	0	0	0	0.698	3.86	22.02
Government	5631	0.0003	0.004	0	0	0	0	0.131	18.31	381.77
Directors	5631	0.104	0.176	0	0	0	0.148	0.871	1.82	5.41
CEO	5631	0.051	0.127	0	0	0	0	0.871	3.13	13.26
Chairman	5631	0.075	0.148	0	0	0	0.092	0.870	2.34	8.14
Exec Dir (ex CEO)	5631	0.053	0.124	0	0	0	0	0.742	2.81	11.02
Non-Exec. Dir	5631	0.005	0.030	0	0	0	0	0.513	9.08	105.27
Panel B: Largest shareholdings										
Institutions	3086	0.158	0.110	0.050	0.100	0.131	0.173	0.899	2.97	14.41
Banks	267	0.151	0.080	0.051	0.102	0.127	0.173	0.503	1.92	6.95
Invest./pension funds	2504	0.167	0.116	0.050	0.105	0.137	0.181	0.899	2.90	13.47
Insurance co's	287	0.090	0.035	0.050	0.063	0.082	0.109	0.259	1.40	5.70
Real estate co's	28	0.191	0.112	0.069	0.146	0.154	0.189	0.520	1.82	6.17
Corporations	595	0.304	0.177	0.050	0.185	0.256	0.392	0.857	0.96	3.25
Individuals/Families	236	0.169	0.112	0.050	0.089	0.134	0.239	0.698	1.666	6.75
Directors	1464	0.287	0.169	0.050	0.156	0.239	0.384	0.870	0.88	2.67
CEO	710	0.306	0.179	0.050	0.160	0.262	0.426	0.870	0.79	2.55
Chairman	1133	0.307	0.173	0.054	0.170	0.260	0.434	0.870	0.73	2.94
Exec Dir (ex CEO)	754	0.271	0.158	0.054	0.151	0.224	0.341	0.742	0.93	4.57
Non-Exec. Dir	93	0.185	0.101	0.055	0.121	0.156	0.239	0.502	1.28	

APPENDIX 6: CONSTRUCTION OF THE PURCHASE AND SALE PORTFOLIO OF DIRECTORS' TRADES.

This table illustrates the process of data cleaning for the directors' dealings file obtained from BARRA Global Estimates described in section 3.1 in the text section of this chapter. In our analysis, we focus only on directors' trades that represent at least 0.1% of market capitalization of their firms. The number of these larger purchase and sale transactions is documented in step 8. Note, however, that the source database reports all transactions of all directors as separate events. For the purpose of our event study, we need to consider transactions of different directors that happened (were announced) on the same day and regard the same firm as one event. Consequently, the number of 'transactions' (reflecting all reported trades) is higher than the number of 'events' (representing only firm-days with trades). 'Transaction-date (announcement-date) events' reflect the number of observations available for our event study when transaction date (announcement date) is defined as the event date. Nevertheless, the final number of observations for the individual models (market model, market-adjusted model, and size-adjusted model) as reported in Table 3.2 differs because of different daily-return data requirements of the individual models.

Step	**Description**	**Number of observations**
1	Total initial number lines (transactions)	58,363
2	After - assigning SEDOL numbers (identification process)	57.664
3	non-financial firms only	47.384
4	matched with number of shares outstanding	47.192
5	consistency check-up for duplicate transactions	35,439
6	Focus on ordinary voting shares	27,416
7	Out of which:	
	purchase transactions	14,500
	sale transactions	6,769
8	The final sample includes transactions > 0.1% of market cap:	
	purchase transactions	2,481
	transaction-date events	1,942
	announcement-date events	**1,889**
	sale transactions	2,668
	transaction-date events	2,078
	announcement-date events	**2,024**

PART II

Chapter 4
Privatization and Corporate Control in the Czech Republic: Institutional Background

4.1 Introduction

The second part of this thesis deals with the actions that new private owners in the Czech Republic undertook immediately after the privatization in order to improve efficiency and profitability of the former state-owned enterprises. Privatization of socialist state-owned enterprises was an important part of the reform program in all transition countries that intended to transform their economies from centrally planned systems to market-driven economies. It is widely acknowledged in the economic profession that private ownership is the crucial source of incentives for corporate innovation and efficiency (Shleifer, 1998). Moreover, Shleifer and Vishny (1994) argue that public enterprises are highly inefficient since they are under pressures from the politicians who control them to pursue political goals. Introduction of private owners removes these pressures and reinstalls the profit-maximization goal that leads to efficiency improvements and innovation. Megginson and Netter (2001) review many recent empirical papers documenting that privatization is highly successful in delivering performance improvements.

After the fall of the communist regime in 1989, the Czechoslovak government opted for fast liberalization/reform program (shock therapy) that aimed to introduce the three essential steps – price liberalization, stabilization and privatization – at a very high speed

(Sachs, 1993). Voucher privatization scheme that allowed for a relatively speedy transfer of ownership rights to private entities was designed as a very important (but not the only) part of the entire privatization program. This chapter positions the voucher scheme within the whole privatization process in the Czech Republic, stresses its main features and highlights its main consequences.

The remainder of the chapter is organized as follows. The next section draws the main characteristics of the whole privatization program in the Czech Republic that includes restitutions, the small-scale and large-scale privatization. Special interest is devoted to the voucher privatization and the role of investment privatization funds within this program. Section 4.3 describes post-privatization developments at the newly established Czech equity markets. Section 4.4 provides a short summary.

4.2 Privatization: how it all started

At the outset of reforms, Czechoslovakia[56] was the most centrally planned country among communist countries in the Central Europe. At that time, the unreformed state-administered sector, with predominantly large firms, produced as much as 97 percent of the country's net material product.[57] As part of the reform process, the existing industrial associations (VHJs) were divided into smaller entities. In fact, some 200 existing VHJs transformed into approximately 4,500 state-owned enterprises (SOEs).[58]

These initial steps prepared the state-controlled corporate landscape for the actual process of privatization involving a combination of standard and non-standard methods. After intense discussions, three main programs, which differed in terms of methods used and the type and value of property privatized, were implemented. First, restitution was designed to return assets to their original owners who lost their property in nationalizations of 1945-48; second, small-scale privatization focused on small businesses,

[56] Till January 1993, the Czech Republic was part of Czechoslovakia. Czechoslovakia ceased to exist on January 1, 1993 when it officially split to the Czech Republic and Slovakia.
[57] The Soviet concept of net material product omitted from GNP those services not directly related to production, such as passenger transportation, housing, and the output of government employees not producing material output.
[58] The legal status of the SOEs changed into 'joint-stock company' after the SOEs entered the privatization process.

predominantly shops, restaurants and minor workshops; and, finally, large-scale privatization involved transfer of ownership of medium-sized and large enterprises. After the split of Czechoslovakia, both successor countries continued the privatization process within this main framework. However, large-scale privatization evolved in different directions in the two countries since Slovakia decided to abandon voucher privatization and favoured uncompetitive direct sales instead. The following sections describe the individual programs.[59]

4.2.1 Restitution and small-scale privatization

Restitution, a non-standard method, was designed to make up for the wrongdoings of the previous regime with regard to unlawful and/or immoral nationalization and confiscation of private property (Olsson, 1999). The property was to be returned in kind, or by providing financial compensation (in cases when the original property no longer existed). The actual value of property returned to the original owners or their heirs in the process of restitution is very difficult to estimate because of the complexity and decentralized nature of the process (Olsson, 1999).[60] In the Czech Republic alone, more than 70,000 apartment houses, 30,000 industrial premises and small businesses, and almost half of state forests, agricultural land and farm property were returned within the process of restitution as of the end of 1995.[61] Restitution was far more extensive in the Czech Republic than in Slovakia. The differences can be partly explained by more negative attitudes towards restitution among leading Slovak politicians. Also, Slovakia was far less developed before 1948, which naturally means fewer restitution claimants.

Small-scale privatization that started as early as December 1990 was designed for the transfer of ownership of small premises such as shops, restaurants, service outlets, small workshops, and rarely small production enterprises.[62] Here, public auction, a standard

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[59] For a detailed description of the privatization process in Slovakia see Olsson (1999).
[60] Nevertheless, OECD estimated that for the whole former Czechoslovakia some 70,000 persons would be eligible for compensation under the Minor Restitution Act, the first part of the process focusing on relatively small assets. Further, some 10 percent of all state property (around $ 10.7 billion) was to be returned under the Large Restitution Act, the second part of the program that in general aimed at transfer of larger assets.
[61] Statistical Yearbook CR (1996).
[62] Small-scale privatization was carried out in compliance with Act No. 427/1990 O*n the Transfer of State Property of Certain Businesses to Other Physical or Legal Persons* that came into force as of December 1990.

competitive method, was the predominantly used method of privatization. In fact, this method was used in 87 percent of ownership transfers within the small-scale privatization till December 1993 (see Table 4.1).[63] In total, more than 24 thousand small businesses were privatized within the small-scale privatization in the Czech Republic, with proceeds of some CZK 36 billion (USD 1.2 billion). The small-scale privatization earned momentum very early in the transition process: more than 14 thousand businesses (58 percent of all units privatized via the small-scale privatization) transferred ownership already in 1991.

TABLE 4.1: SMALL-SCALE PRIVATIZATION.

	1991	1992	1993	1991-93
Number of businesses privatized	14,155	8,332	1,872	24,359
in which privatized in auction	12,492	7,690	911	21,093
% auctions in total	88%	92%	49%	87%
in which shops	7,672	4,219	413	12,304
% shops in total	54%	51%	22%	51%
restaurants and catering	1,451	717	61	2,229
% restaurants in total	10%	9%	3%	9%
Total value in CZK				36 billion

Sources: Statistical Yearbook CR (1994).

4.2.2 Large-scale privatization

Medium-sized and large enterprises were privatized within the large-scale privatization.[64] This program involved most of the property privatized, though the number of privatized units is comparable to the small-scale privatization. The large-scale privatization allowed for a large spectrum of standard as well as non-standard methods. Czechoslovakia became famous for its voucher privatization, the dominant non-standard method. Free transfer of property to municipalities or to the original owners within

[63] The process was formally closed when the local privatization committees were closed down in December 1994.

[64] The main rules of the large-scale privatization are prescribed in the Act No. 92/1991 O*n the Conditions of Transfer of State Property to Other Persons*. Almost all medium-sized and large enterprises were included into this program except of some premises of special importance as, for example, public administration establishments, natural resources, cultural and social establishments, post office, and water works.

restitution is another non-standard method. However, still a relatively large part of property was transferred using standard methods as, for example, auctions, public tenders, or direct sales.

Time-wise, the large-scale privatization was divided into two waves. The government approved lists of companies for both waves at the beginning of the program in 1991. Privatization projects of firms that were scheduled for the first wave had to be submitted before January 20, 1992. The deadline for the second wave was the end of 1992, which is also the date when Czechoslovakia as such seized to exist. Hence, the first wave of large-scale privatization (and voucher privatization) was implemented within Czechoslovakia. The program continued quite smoothly in the Czech part of the former federation with the second wave of voucher privatization executed during 1993-94. While, in Slovakia, the process turned out to be quite complicated with some dramatic turns and setbacks that closely followed political developments and changes of government.[65]

As a rule, privatization of individual enterprises was carried out according to a pre-approved privatization project that was selected from a pool of proposals by the ministry for privatization. In general, any interested party could have submitted a privatization proposal for a state-owned enterprise slated for privatization. Each privatization proposal had to indicate, among other things, the proposed privatization method and the fraction of company to be privatized. It was compulsory for the management of the to-be-privatized companies to submit a privatization proposal. On average, each to-be-privatized SOE attracted 5 proposals indicating quite a high interest on the side of potential investors. Nevertheless, management proposals achieved the highest success rate – 42 percent of approved privatization projects were submitted by the management. Prospective buyers were successful in 35 percent of companies where they submitted proposals (Statistical Yearbook CR, 1996).

After ministry for privatization selected and approved the projects, the National Property Fund (NPF) took care of the execution of the approved privatization projects. This, for example, meant that the NPF founded, if necessary, a new company (joint-stock company was the most common type), or organized an auction or a public tender. The

[65] For a detailed description of the privatization process in Slovakia see Olsson (1999).

NPF also executes ownership rights of shares that temporarily or permanently remain in the state possession.[66]

In the Czech Republic, vouchers dominated the whole process of the large-scale privatization, though other standard methods were used as well. Panel A of Table 4.2 shows the relative frequency of the individual methods used within the large-scale privatization. According to the number of units privatized, the most common method involved direct sales (used in almost 50 percent of all units). However, the average book value per firm (CZK 7.61) indicates that these firms were relatively small. Indeed, auctions, public tenders, and direct sales (the standard methods) were used for the smaller firms privatized in the large-scale privatization. To the contrary, privatization of only about 9 percent of all units but essentially the largest firms (with average book value per firm about 40-times larger than that for the standard methods) involved creation of new joint-stock companies. This 9 percent of firms represents 80 percent of the total book value of property privatized in the large-scale privatization. The NPF was responsible for the establishment of 'new' joint-stock companies and distribution of their shares using standard as well as non-standard methods. In total, large-scale privatization involved 5,125 firms.

Panel B of Table 4.2 shows the methods used for distribution of shares in the newly founded joint-stock companies. A majority of the shares (66 percent with book value of CZK 341.75 billion) were exchanged for vouchers.[67] Still, 16 percent of the shares were sold using standard methods (direct sales, public offers or tenders), 10 percent transferred for free to municipalities, and 8 percent deposited with restitution funds. Panel C of Table 4.2 summarizes the methods used within the large-scale privatization. It turns out that the voucher method was used for 48 percent of property privatized (measured in book value). Almost a third of the property (30 percent) involved standard methods. The remaining property was transferred (for free) to municipalities and the restitution funds.

[66] As of December 2002, the NPF still owned shares in 189 companies.
[67] Voucher privatization is in more detail described in the following section.

TABLE 4.2: LARGE-SCALE PRIVATIZATION

	Total book value of property (bn CZK)	% in total	Number of firms	% in total	Average book value per firm (mn CZK)
Panel A: Privatization method used					
Auction	8.97	0.9%	1,934	8.4%	4.64
Public tender	36.12	3.7%	2,171	9.5%	16.64
Direct sale	86.90	8.9%	11,423	49.8%	7.61
Joint-stock companies [a]	776.49	79.5%	1,973	8.6%	393.56
Free transfer [b]	68.40	7.0%	5,425	23.7%	12.61
Total	976.88	100%	22,926	100%	42.61
Panel B: Joint-stock companies at NPF [c]					
Shares for sale, in which:	85.32	16.4%			
direct sale to a domestic buyer	26.86	5.2%			
direct sale to a foreign buyer	14.15	2.7%			
employee shares	2.2	0.4%			
public offers and public tenders	42.11	8.1%			
Shares for free transfer, in which:	433.9	83.6%			
voucher privatization	341.75	65.8%			
municipalities	53.25	10.3%			
funds [d]	38.9	7.5%			
Total	519.22	100%			
Panel C: Methods in total (recapitulation) [e]					
Standard methods	215.11	29.9%			
Vouchers	341.75	47.5%			
Other non-standard methods	162.75	22.6%			
Total	719.61	100%			

Notes: Panel A refers to book value of property *approved* for privatization as of June 30, 1998, whereas Panel B refers to book value of equity transferred as of Dec. 30, 1997.

[a] This method involves incorporation of companies (mainly assigned for voucher privatization) with the NPF as the temporary possessor/manager of the new shares. However, some shares remain permanently in the possession of the NPF (hence the state). This stakes in long-term possession of the NPF are excluded in recapitulation of panel C.

[b] Includes transfer to municipalities and restitution claims.

[c] Describes distribution of shares of newly incorporated state-owned enterprises via the NPF. Total book value of shares in Panel B is not equal to the entry of *'joint-stock companies'* in Panel A. The former includes only shares distributed, whereas the latter includes total book value of the incorporated companies (this includes, for example, also shares in permanent possession of the NPF).

[d] *Funds* stands for the Restitution Investment Fund, Endowment Investment Fund, and Guarantee Relief Fund for Agriculture and Forestry.

[e] In this panel, standard versus non-standard methods are recapitulated. *'Standard methods'* include auctions, public tenders, public offers, and direct sales. *'Vouchers'* represent value of property distributed to citizens for vouchers. *'Other non-standard methods'* includes employee shares and other free transfers, for example, to municipalities. The numbers are calculated as follows: first, the entries from Panel B are substituted instead of the entry *'joint-stock companies'* in Panel A, and, second, all the entries of extended Panel A are assigned to their method group (standard, vouchers, other non-standard).

Source: Statistical Yearbook CR (1998).

4.2.3 Voucher privatization

Czechoslovakia, and later the Czech Republic, gained reputation for the voucher-privatization program. As shown in the previous section, almost half of the property privatized within the large-scale privatization involved transfer of shares for vouchers. Moreover, implementation of the voucher privatization deserves interest because of its consequences for capital market development (see Section 4.3). It created 'new' joint-stock companies that were later listed at the local stock exchanges. Also, the creation of investment privatization funds (IPFs) assisted in the process of collective investment development. The IPFs were to be of dominant importance in bringing about the resulting ownership concentration (see the following subsection). Furthermore, the voucher privatization, through mass participation of citizens in the actual process of privatization and later in the newly established capital market insured education of citizenry about securities and institutions of capital markets.

The basic idea of this unprecedented privatization method was to provide the population with virtual investment capital in order to privatize fast and also to compensate the population for wrongdoings of communism. As part of the large-scale privatization, the voucher privatization was organized in two consecutive waves.

The supply side of the first, federal wave of voucher privatization consisted of property worth Kcs 299 billion[68] (USD 10.3 billion) in 1491 enterprises, out of which Kcs 212 billion in 988 firms was provided in the Czech Republic and Kcs 87 billion (503 firms) in Slovakia (see Panel A of Table 4.3). The demand side was represented by vouchers held by interested citizens. Every adult citizen residing in the country could buy a voucher booklet (for Kcs 1,000, USD 34, and a registration fee of Kcs 35, USD 1.2) with 1000 points. With these points he/she could later directly bid for the shares of firms or offer them to investment funds. Some 5.9 and 2.6 million citizens in the Czech Republic and Slovakia, respectively, registered for the first wave.

In the so-called 'zero round' that started on 1st of March, 1992, before demand and supply actually met, the participants had the option to 'invest' (a part of) their vouchers

[68] Kcs (Czechoslovak Koruna) was the currency used in Czechoslovakia that ceased to exist after the split of the country. CZK (Czech Koruna) and SKK (Slovak Koruna) are the currencies used in the Czech Republic and Slovakia, respectively.

TABLE 4.3: VOUCHER PRIVATIZATION.

Panel A: First wave in Czechoslovakia

	Number of firms	Total book value of firms (bn Kcs)	Book value offered for vouchers (bn Kcs)	Per cent offered for vouchers	Number of firms after reorganization	Book value offered for vouchers (bn Kcs)
Czech	943	362.2	206.42	57%	988	212.49
Slovak	487	133.6	90.11	67%	503	86.9
Federal	61	72.8	2.86	4%		
Together	1,491	568.6	299.39	53%	1,491	299.39

Panel B: Second wave in the Czech Republic

	On offer in total	in which firms from the 1st wave	in which			
			≤ 34% for vouchers	> 34% but ≤ 50% for vouchers	> 50% but < 96% for vouchers	≥ 96% for vouchers
Number of firms	861	185	250	109	397	105
Total book value offered for vouchers (CZK billion)	155	24.38	43.34	35.89	66.01	9.76
% in total book value	100%	16%	28%	23%	43%	6%

Sources: Statistical Yearbook CR (1993, 1994) and Olsson (1999).

into investment privatization funds, which then used the vouchers on their behalf. In the first wave, 72 percent of all vouchers were given to 429 investment funds, which were often affiliated with banks.

Demand and supply then met at a computerized market place. The system registered bids from directly investing citizens as well as IPFs and compared them to supply in an iterative process of five consecutive rounds.[69] The market was designed in such a way that both demand and supply could influence the prices and allow considerable price discovery. It also induced learning on behalf of the bidders. After the fifth and final round, out of the total of 8.5 billion voucher points only 1.2 percent were left unused. These points were declared worthless. On the supply side, 21.7 million of shares (which represents 7.2 percent of the shares offered) remained unsold. They remained in the possession of the respective republic's NPF. This was regarded to be a very positive result. The whole process had gone smoothly and fast. The shares were distributed to the new owners in April and May 1993 in Slovakia and the Czech Republic, respectively. They

[69] For a detailed description of the five rounds of auctions see Claessens (1997), Hingorani et al. (1997), and Olsson (1999).

were issued in dematerialized form and kept at the national Securities Centres that were also devised to register all subsequent transactions. Consequently, shares started to be traded at the electronic over-the-counter market and at the Prague and Bratislava stock exchanges.[70] According to the analysis of M.E.S.A. 10 (Niznasky and Reptova, 1999), based on the prices during the five rounds and consequent market prices, average citizen participating in the first wave of the voucher privatization acquired property in market value of Kcs 18,400, i.e. an 18-fold return on 'invested' capital.

The second wave of the voucher privatization was in this form executed only in the Czech part of the former federation and used the old institutional set up of the first wave. It started in January 1994, and ended in October the same year. This time, total book value of property offered was CZK 155 billion in 861 companies (Panel B of Table 4.3). While in the first wave, 89 percent of firms offered at least half of their shares via vouchers (see Table 4.6), it was only 58 percent in the second wave. The remaining shares were privatized in the first wave of the voucher privatization or transferred through other methods (e.g. direct sales). The investor participation was very similar to the first wave: approximately 6.2 million Czech citizens purchased voucher booklets and some 353 IPFs competed for the voucher points (Coffee, 1996).

4.2.4 Investment funds in the voucher privatization

Investment privatization funds played an important role in the process of the voucher privatization and later on as key players in the corporate-control structures of the privatized companies. The architects of the voucher privatization program were aware that their program with broad participation of citizens might result in dispersed ownership with potentially unfavourable consequences for the resulting corporate-control structures and managerial unaccountability. Therefore, their program of voucher privatization included an idea of intermediary financial institutions for collective investment modelled loosely after Western mutual funds. The initial intention was that the state would play no role in creating or staffing of these funds, other than in establishing certain minimal ground rules for their creation and operation (Coffee, 1996).

[70] Section 4.3 gives more detail concerning the individual market places.

The IPFs were established at the beginning of the first wave as joint-stock companies that were allowed to collect voucher points from the citizens (in the 'zero-round') and invest them during the voucher privatization. In general, one founder company could have established more than one investment fund. In total, 343 parent investment companies with 429 IPFs took part in the first wave. Some of the funds were purely private, but the majority of the founders (especially of the larger funds) were still state-owned domestic banks.

It is commonly believed that the IPFs made the whole voucher privatization program popular among the citizenry and motivated many people to register and take part in the program. The deadline for registration was set for 15 February 1992. Still, by mid January, only about 2 million of participants had registered for their voucher points which was just half of the officially expected participation. The turning point came when IPFs started their aggressive campaign pursuing people to put voucher points to the funds. Their attractive offers convinced many to participate in the program. The final number of registered voucher holders was 8.5 million people in the whole federation.

As mentioned at the beginning of this section, the initial regulation of the investment funds was very limited. It specified only three basic requirements: (i) minimum own capital of CZK 100 thousand or USD 33.3 thousand, (ii) certain professional qualifications of the members of its supervisory board and its officers, and (iii) a depository contract with a bank. Only the big success of the IPFs' advertising campaign prompted a legislative reaction. Temporary regulations requiring portfolio regulation were swiftly put together and adopted in January 1992, shortly before the actual rounds of the first wave started in May the same year (Coffee, 1996). IPFs were required to diversify their assets so that they did not invest more than 10 percent of their capital in any one security and were restricted from owning more than 20 percent of the nominal value of securities issued by the same issuer. One (parent) investment company (that could control several IPFs) could not own more than 40 percent of the nominal value of securities issued by the same issuer. The Law on Investment Companies and Investment Funds was approved in April 1992 and came too late to influence the first wave. But it had important consequences for the second wave. The most important modification was that the new regulation allowed the unit trust format (as opposed to the prescribed format of joint-stock companies up to that date).

Then, the funds were required to appoint managing and supervisory boards and limitations were placed also on the permissible compensation that the IPFs could pay to their investment companies (Coffee, 1996).

At the end, the IPFs attracted as many as 72 percent of all registered voucher points in the first wave which indicates their important role in the distribution of shares (see Table 4.4). Table 4.4 also shows that the voucher points were concentrated in only a few large funds. The biggest seven (parent) investment companies (with more than 200 million voucher points each) concentrated 45 percent of all voucher points which is 62 percent of the voucher points hold by all IPFs together. The smallest 291 investment companies attracted together only 4 percent of the points. Still, 28 percent of the voucher points were not entrusted to any IPF and remained for individual investment by citizens.

TABLE 4.4: VOUCHER PRIVATIZATION: CONCENTRATED DEMAND, THE INVESTMENT POINTS

	# of funds	Points (bn)	% of total	% of ICs
Available investment points: total		8.54	100%	
Investment companies (ICs): total		6.14	72%	
of which (mn. pts/IC in parenthesis)				
7 biggest (>200 mn pts)	26	3.82	45%	62%
6 big (>100 mn pts)	23	0.85	10%	14%
39 medium (>10 mn pts)	65	1.16	14%	19%
291 small ICs (<10 mn pts)	315	0.31	4%	5%
Individual investors (DIKs): total		2.40	28%	

Notes: Each investment company (IC) could find several investment privatization funds (IPFs) with differing investment profiles. In fact, 343 investment companies found 429 individual funds.
Sources: Brom and Orenstein (1994); Centre for Voucher Privatization (1995).

Table 4.5 documents distribution of the voucher points and shares among the biggest ten individual investment companies. The biggest investment company attracted 11 percent of the voucher points and exchanged them for 8 percent of all shares offered via the first wave of the voucher privatization.[71] The ten largest investment companies together ended up with 39 percent of all shares indicating high ownership concentration by the IPFs in the privatized companies. More information on resulting ownership structures

[71] Prices differed across individual issues. These numbers indicate that this investment company purchased relatively more expensive shares. On pricing of shares in the first wave of the voucher privatization see Claessens (1997).

in privatized companies is provided in Table 4.6. It shows that out of 842 firms that offered more than half of their shares via vouchers, IPFs controlled majority of all shares in 334 firms and 272 firms were majority owned by atomistic individuals. A single largest investment company controlled as much as 30 percent of shares in 9 companies. Two funds' combined stakes resulted in a majority stake in 2 firms and 30-percent stake in 319 firms. All these numbers document high control power in hands of a few IPFs.

TABLE 4.5: DISTRIBUTION OF INVESTMENT POINTS AMONG THE LARGEST INVESTMENT COMPANIES IN CZECHOSLOVAKIA, 1992

Investment Company	Pts.	IPFs	% of points		# of shares held	% of shares	
	mn.	no.	All	in IPFs	mn.	all	in IPFs
Ceská státni sporitelna (CR)	950.4	1	11.1	15.6	21.4	7.7	12.2
První investicní, a.s. (CR)	724.1	11	8.4	11.8	13.6	4.9	7.7
Harvard group (CSFR)[1]	638.5	8	7.5	10.4	15.2	5.5	8.6
VUB Invest, a.s. (SR)	500.6	1	5.8	8.2	12.0	4.3	6.8
IKS KB, s.r.o. (CR)	465.5	1	5.4	7.6	11.9	4.3	6.8
Kapitál. invest, a.s. (CR)	334.0	1	3.9	5.5	7.6	2.7	4.3
Slovenské investicie, s.r.o. (SR)	333.0	1	3.9	5.4	11.0	4.0	6.3
Cassoviainvest (SR)	168.9	4	2.0	2.8	7.7	2.8	4.4
Creditanstalt, a.s. (Austria/CR)	166.2	1	1.9	2.7	3.6	1.3	2.0
PSIS (SR)	117.5	3	1.4	1.9	4.9	1.8	2.8
Total ten largest in CSFR	4,398	32	51.4	72.0	108.9	39.2	61.9

Note: The part of federation (Czech Republic versus Slovak Republic) given in parentheses.
Source: Lastovicka et al. (1994)

TABLE 4.6: OWNERSHIP STRUCTURE OF FIRMS PRIVATIZED VIA VOUCHERS, 1ST WAVE

	# of firms where given investor holds more than x% of shares			
	50%	**30%**	**10%**	**0%**
Investors with voucher points				
small individual investors	272	559	911	949
investment funds, total	334	631	876	949
single largest funds	0	9	747	949
two largest funds	2	319	860	949
four largest funds	196	605	873	949
Total vouchers	842	920	946	949
Non-voucher investors				
foreign investors	19	34	45	51
domestic direct investors	16	28	48	58
NPF – temporary ownership	21	50	182	293
NPF – permanent ownership	2	7	11	21

Note: Only firms in the Czech Republic are considered. The total number of firms is 949.
Source: Lastovicka et al. (1994)

Some of the firms offered a part of their shares also to foreign and domestic non-voucher investors. Foreigners bought shares in 51 firms, whereas domestic (direct) investors in 58 firms (see Table 4.6). A relatively large fraction of these investors was interested in large controlling stakes: 19 (16) foreign (domestic) investors ended up with majority stakes. The state was (after the first wave in 1993) still an important player. The NPF was a majority shareholder in 23 companies and held at least some shares in as many as 314 companies. Some of these shares were sold in the second wave of the voucher privatization (see Table 4.3), some using standard methods over 1993-2002. Nevertheless, the state was still present in 189 firms with a book value of CZK 138 bn. (approximately USD 4.6 bn.) at the end of 2002. A large part of this property (CZK 121 bn.) belongs to 21 'strategic' companies. As these companies are important players of the Czech economy and often hold a monopolistic position in their product markets (e.g., electricity, gas, telecommunications), the state wants to stay involved. In 49 firms, the NPF holds just one 'golden' share that ensures the state a superior voting right, mostly concerning a main line of business or a trademark.

In the second wave, 353 registered IPFs attracted 64 percent of all voucher points (as opposed to 72 percent in the first wave). Also the level of concentration of the voucher points in the largest funds declined relative to the first wave. The 15 largest funds accumulated approximately 2.5 billion points that represented 41 percent of all points in the second wave (compare to 55 percent to 13 largest funds in the first wave). Table 4.7 shows that IPFs' ownership share was lower in firms privatized in the second wave versus the first wave. To the contrary, individual voucher investors, the state, and other non-voucher investors held more shares. Still, these types of investors remain relatively small.

TABLE 4.7: OWNERSHIP STAKES (IN %) BY INVESTOR TYPE

Investor type	1st wave	2nd wave
bank sponsored IPFs	23.8	5.8
non-bank sponsored IPFs	24.6	31.0
foreign investors	0.1	2.1
domestic direct investors	0.0	1.0
NPF	2.1	7.6

Note: Only for firms privatized via the voucher method.
Source: Claessens et al. (1997)

In summary, IPFs arose from the voucher privatization as important players in the Czech corporate landscape. They attracted 72 and 64 percent of all voucher points in the first and second wave, respectively, and, consequently acquired important stakes in privatized companies. This fact has several positive and negative consequences.

The establishment of IPFs helped to overcome dispersed ownership by many atomistic shareholders. As collective actions of many atomistic shareholders are very costly and not very probable, dispersed ownership would grant incumbent managers unaccountable control and raise questions concerning restructuring and future firm value. The IPFs accommodated for concentrated ownership which is a positive side of their existence.

Nevertheless, the IPFs' presence also triggers several problems. The first problem concerns the nature of collective investment itself: who monitors the monitor? What motivates the IPFs managers to exert effort and pursue value-maximizing strategies (involving restructuring) of firms in their portfolio, especially in a very turbulent environment with little regulation? The second problem concerns inevitable restructuring of the former SOEs in the IPFs' possession. Many observers have questioned the ability of IPFs to supervise this complex process that requires extensive financial resources and special know-how.[72] The final complication arose within the voucher privatization and was not foreseen in advance. A special combination of bank founders, IPFs' portfolios and state ownership resulted in unclear cross-ownership between banks and IPFs with important state control stakes. Coffee (1996) provides an illustration. The largest financial institution, Ceska sporitelna (the Czech savings bank) was the founder of the largest IPF in the first wave. In the first wave, some 37 percent of its own shares were privatized. At the end of the first wave, 40 percent of Ceska sporitelna's stock remain in the NPF (the state), of the remaining 37 percent privatized via vouchers, roughly 80 percent (or 29.1 percent of its total outstanding stock) was acquired by a limited group of eight major financial institutions. Moreover, the IPF founded by Ceska sporitelna acquired ownership stakes in majority of these banks.

[72] The following two chapters analyze activities of the new owners in the post-privatization period and, so, could contribute to resolving the issue of IPFs' ability to pursue restructuring and efficiency improvements of companies in their portfolio.

4.3 Development of security markets

Establishment of organized security markets in the Czech Republic came as a natural consequence of the voucher privatization. The voucher privatization assigned ownership titles to millions of citizens, and so created demand for an organized market place. After the second wave of privatization, 75 percent of the Czech citizens held shares in publicly traded companies. Naturally, the Czech Republic early came to bolster the most highly capitalized security market in Central and Eastern Europe, having 955 publicly traded issues with a (nominal) market capitalization of around CZK 400 billion (USD 13.4 billion) at the end of 1993.

As it turned out, the establishment of the basic formal institutions for securities trading posed relatively few problems. In fact, within soon, several organized markets for securities trading emerged. In the first place, the official 'national' stock exchange was introduced: the Prague Stock Exchange (PSE) began trading in April 1993. Another organized market, 'RM-Systém', represents electronic trading system that came into existence as a direct consequence of the voucher privatization.[73] This electronic market was set up to cater for the 'retail market' of ordinary citizens wanting to sell or buy shares quickly. It allows the citizens to differ from the official exchange because it is not based on the membership principle. Each citizen participating in the voucher privatization is automatically registered at the RM-S, and can, consequently, conduct trade without the use of a broker. In addition to these two market places, over-the-counter trade could have been conducted via the Securities Center (SCP). The SCP was established in 1993 as a centralized register of all dematerialized securities and their owners. As it is the person registered with the SCP who has all ownership rights associated with a dematerialised security, all ownership transactions have to be registered with the SCP. In the period after the voucher privatization, it had been possible to register transactions directly with the SCP without any intermediation of the RM-S or PSE. In summary, this process shows that already in the early stages of the transformation process, the Czech market bolstered not only an impressive number of traded issues, but also several trading venues.

[73] RM is short for 'Registracni Misto' (registration site); the place where registration of voucher bids by citizens and investment funds took place.

Nevertheless, it started to be evident soon that the newly established security markets had not created environment conducive for low-cost trading, transparency and correct firm valuation. This came as a consequence of the government passivity towards capital-market supervision. The government underestimated the importance of the supportive regulatory framework and difficulty associated with its establishment. Moreover, even the little regulation in place was difficult to enforce as many listed firms faced incentive problems associated with the requirement of compulsory public listing/trading for all firms privatized via the voucher method. As the companies did not wish to be listed, they were not motivated to provide reliable information, and markets soon become non-transparent, overissued and illiquid. As a result, the markets fast lost public confidence.

The turning point came in 1996 with the appointment of Tomas Jezek to the PSE Chairman. Amendments to existing PSE regulations, effective from 1 July 1996, made take-over bids mandatory for owners acquiring at least 50 percent of share capital and increased disclosure requirements. However, the PSE still struggled to improve enforcement of the rules. An independent watchdog that would replace the immensely inefficient supervision by the ministry of finance was still missing. At last, the Securities and Exchange Commission (SEC) started its activity on 1 April 1998.[74] The SEC has since its establishment made significant progress in cleaning up the market. A large number of fines and other administrative measures have been used to discipline market actors, especially for failing to fulfil their legal responsibility of financial disclosure.[75] In addition, investor protection has also improved as the SEC monitors suspicious (insider) trading. Nevertheless, it is believed that the SEC should still become more independent from the ministry.

The transparency of the capital market and protection of minority shareholders has further improved since the 2001 amendments of the Commercial Code and the Securities Act that strengthened the SEC's position. The SEC was granted enforcement rights for the existing regulations which are important especially concerning mandatory take-overs and reporting of ownership and control rights of important stakeholders. Furthermore, the new

[74] SEC was founded based on the Act no. 15/1998. It has five members nominated by the Ministry of Finance and the government but appointed by the President of the Czech republic for a period of five years.
[75] According to representatives of the SEC this has also resulted in that disclosure discipline has increased from some 60 per cent of issuers in the mid-1990s to more than 95 per cent in 2001.

regulations toughened listing requirements (concerning minimal market capitalization and free float) that forced many firms out of the organized markets. Over 2001, 458 issues had to leave the RM-S and further 360 issues decided to leave the public market voluntarily. At the PSE, 18 firms did not meet the legal requirements for their listing and left the market. Finally, the SEC introduced Principles of Corporate Governance that should help to guide firms in establishing and maintaining sound corporate-governance practices.

In general, the regulation of capital markets in the Czech Republic has improved substantially since 1996. Still, many observers believe that the Czech capital market is segmented, illiquid and non-transparent mainly because of its unusual institutional setting: a parallel existence of two trading venues (the PSE and RM-S) in a very small economy. Another unfavourable development in the Czech equity market is illustrated by its disability to introduce an initial public offering over its ten-year existence. This is a crucial drawback as one of the main functions of equity markets is to accommodate firms with ways to raise new equity capital. Moreover, the number of listed equity issues is still steadily decreasing as many of the listed firms have been acquired by strategic investors who are not interested in public tradability of the firms.

Table 4.8 below illustrates the situation at the outset of the PSE and its development over the 1990s. Market capitalization (as a percentage of GDP) gives a feeling for the depth of a security market. In general, market capitalization of the PSE has been relatively steady, although there is a noticeable decline after 1995/1996 which is a consequence of declining prices and delistings of many shares. Still, the PSE remains among the top capitalized markets in the region. The process of reconciliation at the PSE is evident from the second indicator in Table 4.8: the number of share issues traded. Immediately after the voucher privatization, more than one thousand equity issues were traded at the PSE. It peaked in 1995 with 1670 issues when the shares from second wave of voucher privatization were introduced to the market. However, as a result of stricter regulation and listing requirements, the number if issues dropped from 1670 to 320 (due to changes on the free market – 3rd tier) over 1997. Since then, the numbers have declined steadily further as the regulation and market supervision (by the SEC) improved. Only 102 issues were traded on all three tiers of the PSE at the end of 2001. Market capitalization per issue

(the following indicator in Table 4.8) increased as a consequence of the numerous delistings which should be considered a positive development.

TABLE 4.8: KEY INDICATORS OF THE PRAGUE STOCK EXCHANGE, 1994-2000

	1994	1995	1996	1997	1998	1999	2000
market capitalization (% of GDP)							
total equity market	29.9%	34.7%	34.3%	29.7%	23.1%	26.2%	23.2%
of which listed securities (tier 1 & 2)	15.4%	20.0%	26.9%	24.5%	19.4%	22.7%	19.7%
# of traded issues							
total equity market	1,028	1,716	1,670	320	304	195	151
of which listed securities (tier 1 & 2)	34	68	96	103	106	89	65
unlisted securities (tier 3)	994	1,648	1,574	217	198	106	86
forced delistings	14	20	30	41	72	180	317
market capitalization per issue (mn USD)							
total equity market	12.2	10.5	11.8	44.7	45.6	68.4	75.3
of which listed securities (tier 1 & 2)	191.0	152.6	161.4	114.4	109.6	130.2	148.9
unlisted securities (tier 3)	6.1	4.6	2.7	11.6	11.4	16.5	19.7
turnover ratio (% mkt. cap.)							
total equity market	12.1%	26.3%	46.3%	49.7%	41.5%	34.1%	59.6%
of which listed securities (tier 1 & 2)	15.3%	28.6%	44.0%	53.2%	45.0%	37.9%	68.9%
volume traded as % of GDP							
total securities market	5.2%	14.1%	25.0%	40.7%	47.8%	64.8%	64.0%
total bond market	1.6%	5.1%	9.1%	26.0%	38.2%	55.9%	50.2%
total equity market	3.6%	9.1%	15.9%	14.8%	9.6%	8.9%	13.8%
average daily volume (CZK mn.)							
total equity market	264	537	1,004	985	688	644	1,061
of which listed securities (tier 1 & 2)	173	337	749	868	625	623	1,042
unlisted securities (tier 3)	92	200	255	117	62	21	18

Source: Prague Stock Exchange; Statistical Office of the CR.

Liquidity, measured by a turnover ratio (volume as a percentage of market capitalization), shows a significant decline during 1998-99 and recovery again in 2000. The turnover peaked in 1997, in the year with drastic reductions in number of issues traded. Despite the many delistings of (probably) the most illiquid issues, liquidity dropped in 1998/99, but recovered again in 2000. Liquidity of the listed issues on the first and second market tier (69 percent in 2000) is slightly higher relative to the whole equity market, but still very low compared to, for example, the Warsaw Stock Exchange with turnover of around 130 percent. It indicates that the free float (even) of the most frequently traded equity issues is very low and proves that the recent regulatory steps are justifiable.

Volume traded over GDP shows ability of a securities market to attract capital on an economy-wide level. The total volume of the PSE increased from only 5 percent in 1994 to 64 percent of GDP in 2000. This trend is, however, fully due to the increasing volume on the bond market and the equity market remains to contribute just a fraction of the total volume. In 2001, the total volume of equity trading was just CZK 129 billion compared to CZK 1858 billion of bond trading. On the equity market, most of the trading is due to the listed issues on the fist and second tier. Even though, the number of shares listed here declined, the daily volumes increased considerably.

Table 4.9 illustrates the relative importance of the individual venues – the PSE, RM-S and SCP – in trading of equities. It is evident that the PSE attracts the most trading (almost 90 percent in 2001). The polarization of trading towards the PSE has soared since 1997 as volume of trading has steadily increased at the PSE but decreased on the RM-S. The trend towards a marginal importance of the RM-S may lead to a final closure of this market venue. Many believe that such development would increase price transparency and efficiency of the Czech securities markets.

TABLE 4.9: RELATIVE IMPORTANCE OF DIFFERENT VENUES: EQUITY TRADING AT THE PSE, RM-S AND SCP, 2000-2001

	2000		2001	
	CZK billion	%	CZK billion	%
PSE	264.2	82.5	128.8	88.0
RM-S	36.9	11.5	13.5	9.2
SCP	19.3	6	4.1	2.8
Total	320.4	100	146.4	100

Source: SEC

4.4 Short summary

This chapter provides an overview of the privatization process in the Czech Republic and the development of equity markets that arose as a direct consequence of the privatization program. Privatization as a part of the reform process was designed to facilitate fast economic changes at the micro level. Transfer of ownership to private hands

together with increased competition, and hardening of budget constraint should have motivated former SOEs to reorganize their activities so that they become efficient and profitable. The following two chapters analyze activities of the voucher-privatized firms in the post-privatization period and attempt to evaluate the effectiveness of these restructuring activities. The main purpose of this chapter is to put the voucher privatization into a broader perspective of the whole privatization process and to stress the importance and consequences of some unique features of the voucher program for the future development on the corporate-control as well as equity-market level.

The Czech reform process is renowned for its unprecedented voucher privatization. Very often, however, the voucher privatization is highlighted, as if it was the only privatization method adopted. The second section of this chapter positions the voucher privatization in the entire Czech privatization program that was, in principle, divided in two parts: the small-scale and large-scale privatization. The former program involved just around 4 percent of the total value privatized (measured in book value of assets), but concerned almost as many business units as the large-scale program. As the small-scale privatization commenced already at the end of 1990, it significantly contributed to increasing public confidence in reforms and increasing competition.

Nevertheless, the economy-wide effect of the large-scale program involving around CZK 1000 billion (USD 33.5 billion) of property is more pronounced. Almost half of the property offered within the large-scale privatization was transferred using vouchers. Another third was privatized via standard methods (direct sales, public tenders and auctions). A mix of free transfers to municipalities and restitutions was used for the remaining firms. It is important to note that often a combination of different methods was used to privatize one company. For example, a foreign investor bought 30 percent of a firm in a direct sale, 10 percent remained in the state hands and the remainder was offered for vouchers. Thus, the total value of property of firms that were at least partially privatized using vouchers represents more than 50 percent of assets in the large-scale program. Unmistakably, the voucher-privatization program affected a significant fraction of the Czech economy.

The voucher-privatization program cannot be mentioned without highlighting the contribution of investment privatization funds. As the IPFs played a key role in inducing

public interest for participation in the voucher program, they significantly contributed to its overall success. Nevertheless, it is often stressed that the IPFs are responsible for unsound corporate-control arrangements in the privatized companies. It should be stressed, however, that the IPFs contributed to a higher ownership concentration that may still be superior to the alternative of dispersed ownership. It is perhaps the lack of regulation and the governmental policy of laissez-faire that should be blamed for negative consequences of the IPF ownership. Still, the IPFs as a group emerged from the privatization process as the most influential players/owners with the highest average concentration of shares in the newly privatized firms.

The voucher privatization created a wide base of security owners among the Czech population. With the intention of easy transferability of shares among citizens in the post-privatization period, the creators of the privatization program decided that all firms privatized via the voucher method should be introduced to an organized equity market: the Prague Stock Exchange and the RM-System. The number of traded issues on these two trading venues was astonishing. However, it soon turned out that public tradability of so many companies is perhaps not optimal and that stricter regulation and supervision of the market is necessary for its transparency and public confidence. The process of regulation strengthening has resulted in significant reconciliation at both the PSE and the RM-S. For illustration, the number of traded equity issues on the PSE decreased from 1716 in 1995 to only 102 in 2001. This development shows that concentrated private ownership (possibly by foreign strategic investors) is the optimal control structure for many former state-owned enterprises with immense need for restructuring and efficiency improvements.

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Chapter 5
Enterprise Performance and Post-Privatization Managerial Turnover: Evidence from the Czech Republic*

5.1 Introduction

In large corporations, ownership and management are separated so that the managers control the firms' affairs on behalf of the owners but without their direct and immediate supervision. This separation of ownership and management leads to the well-known *principal-agent* problem (Jensen and Meckling, 1976), which requires an effective system of corporate governance to be resolved (Shleifer and Vishny, 1997). The principal-agent problem took on an additional dimension in the former socialist command economies where owners were literally non-existent. Instead, managers of state-owned enterprises (SOEs from now on) were supervised by government officials who, in effect, were more concerned about redistribution of rents and plan fulfilment rather than efficient management of firms' affairs.

Privatization, as an integral part of the complex reform process in post-communist economies, was designed to introduce new private owners who would push for innovation and improved efficiency (Shleifer, 1998). Roland (2000) argues that the transfer of

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ownership to private hands increases efficiency in two ways: first, by improving the matching of managers and productive assets, and, second, by creating better incentives for managers. The importance of these two channels – better human capital at the top managerial level and improved managerial incentives – has already been tested in the context of transition (among others, Groves et al., 1995, in a Chinese setting, Barberis et al., 1996, for small Russian shops, Frydman et al., 1998, for firms in four Central-European economies, and Claessens and Djankov, 2000, for privatized Czech companies). In general, these studies reach a common main conclusion that only changing incentives faced by the incumbent managers does not suffice, it is the change of management that leads to restructuring and improved performance. Moreover, the evidence provided by Frydman et al. (1998) suggests that privatization to insiders who then naturally resist changes at the top managerial positions is inferior to privatization to outsiders and also to state ownership.

Our analysis further extends the empirical evidence on both the determinants and impact on performance of managerial turnover after privatization in a transition economy. In order to increase efficiency of their firms, the new private owners have to replace managers who perform poorly. However, this situation entails the standard principal-agent relationship. As the agent has some private relevant information that is not known to the principal (e.g., the manager's abilities or the firm's potential productivity) an adverse selection problem may arise. In addition, moral hazard may also be present since the manager can take actions that affect the firm's productivity and cannot be directly observed by the principal. The principal (the new owner) in turn cannot distinguish between the potential reasons for the firm's poor performance: inherently low productivity of the firm, incompetence of the manager, managerial decisions that pursue goals other than productivity, or pure bad luck (Groves et al., 1995).

To shed some new light on these issues, the focus of our analysis is two-fold. First, we study the circumstances of the first post-privatization change of the CEO. High managerial turnover immediately after the transfer of ownership would indicate (at least indirectly) that the new private owners actively search for managers with human capital that better corresponds to the needs of their firms than the incumbent managers (who were appointed during the communist period or during the turbulent times immediately after the regime

change). We also test whether the probability of managerial change is related to the firms' past performance. In particular, it is reasonable to expect that managers of poorly performing firms would be at a greater risk of dismissal. Yet, the relationship between performance and the probability of managerial turnover is likely to depend also on the specific ownership/control characteristics of the firms. We conjecture that concentrated owners, because they typically actively monitor the firm and/or directly participate in running its business, have better access to inside information concerning firm value and abilities of the management (as shown in Chapter 3 of this thesis). Therefore, poor past performance may play more important role in revealing low qualities of the managers in firms without concentrated, monitoring shareholders. Moreover, shareholders with relatively low control and cash flow rights are not much motivated to exert effort and push through changes unless firm performance is very poor (Franks et al., 2001).

Second, we analyze the effect of appointing a new CEO on firm performance. Groves et al. (1995) argue that a significant improvement of firm performance after the managerial change points out to the existence of unfulfilled potential of the firm prior to the change. Thus, ex post improvement constitutes indirect evidence of ex ante poor managerial performance. The owners may have private information (or intuition) about performance of the incumbent managers and replace them when there is a potential for improvement. This would document that the new private owners introduce a manager with human capital that more matches the firm's productive assets as put forward in Roland (2000).

An important contribution of this study is that we combine the cross-sectional analysis of the performance-CEO turnover relation with a panel analysis that may reveal changes in firm's (total factor) productivity after CEO change relatively to productivity before the change. The later method may pick-up CEO turnover that is motivated by superior information available to the new private owners concerning the unfulfilled potential of their firms that goes beyond simple past performance measures of the former method. This is also how our analysis extends the previous work on this topic, in particular that of Claessens and Djankov (1999) who analyze the relationship between managerial change and performance in a cross-sectional setting. In particular, they compare productivity and profitability improvements between 1994 and 1996 for three groups of voucher-privatized

Czech firms: (i) firms with a CEO from before 1990, e.g. no managerial change since the beginning of reforms; (ii) firms with a CEO that was replaced between 1990 and the privatization; and (iii) firms with managers that were replaced by the new private owners after 1994. They find that firms with a managerial change after 1990 (the two latter groups) increased their labour productivity and profitability significantly more than firms without a managerial change (the first group). However, performance of firms with managerial changes before versus after the privatization was not significantly different. The focus of our study is different: we consider only managerial changes introduced by the new owners after the privatization and consider changes that occur anytime between privatisation and 1998 (whereas Claessens and Djankov, 1999, consider incumbent managers in June 1994 and assign their firms to the three groups according to the beginning of their tenure). Moreover, by utilizing a panel structure of the data, we are able to compare productivity before and after the managerial change. With our approach, we can thus provide more direct evidence on the effect of managerial change introduced by the new private owners than would be possible with a cross-sectional analysis.

Another contribution is that, in contrast to the previous literature, we account for the specific internal-control structures in place in the Czech Republic that may significantly influence the performance-managerial-turnover relation. The Commercial Code assigns executive powers and the ultimate responsibility for all business matters of the company to the board of directors rather than to the management. At the same time, the CEO (in the Czech Republic usually denoted as the general director) is not always a member of the board and thus does not always exercise this responsibility. Therefore, we argue, that besides CEO turnover, it is important to consider also changes at the post of the chairman of the board of directors and evaluate the relative control power of these two key persons. We distinguish two types of internal-control structures: strong management (whereby the CEO sits on the BoD) and weak management (the BoD is separated from management and oversees its activities). In Section 5.3, we describe the concerning regulation and explain how it affects our hypotheses.

The above mentioned hypotheses are tested on a data set of 917 non-financial privatized firms spanning over a six-year period following the voucher privatization: from 1993 to 1998. We show that the evidence concerning the relation between prior

performance and top managerial turnover in the newly privatized firms is not significant in the first couple of years directly after the transfer of ownership. However, our results suggest that the performance effect becomes significant as a determinant of CEO changes in 1997, some 3-5 years after the privatization, especially for firms with less concentrated control and/or firms with IPF ownership. Our second finding confirms that CEO change delivers a positive shift in (total factor) productivity suggesting that the new private owners replace their managers when there is an unfulfilled potential for performance improvement. However, our third important conclusion is that the positive effect of CEO turnover is significant only when the CEO has a relatively strong position within the firm and is closely linked with the board of directors (which is ultimately responsible for all business affairs of the company). Replacements of the chairman of the board of directors also leads to greater efficiency in this type of firms. To the contrary, replacements of the CEO or chairman of the board do not improve productivity when the management is not part of the board of directors which has the ultimate responsibility for business affairs of the firm. In this case, the board of directors consists only of representatives of the shareholders who usually (in the Czech setting) do not have much experience in the business.

The next section briefly describes findings and conclusions of the existing literature regarding privatization, in general, and its effects in transition economies, in particular. Section 5.3 is devoted to a discussion of the voucher privatization and existing corporate governance framework implemented in the Czech Republic. Section 5.4 introduces the data and Sections 5.5 and 5.6 present the results of our empirical analysis. The last section summarizes the results and presents our conclusions.

5.2 Privatization and enterprise restructuring: theory and evidence

Over the past 20 years, governments increasingly chose to relinquish control over public enterprises. After its debut in the U.K. in the early 1980s, privatization spread to France, Italy, Spain and other market economies. During the 1990s, this trend received a further impetus as formerly socialist countries initiated large-scale privatization programs. At the same time, the economic profession has begun to acknowledge private ownership

as the crucial source of incentives to innovate and become efficient (Shleifer, 1998). Shleifer and Vishny (1994) argue that public enterprises are highly inefficient since they are under pressure from the politicians who use them to pursue political goals.[76] Private ownership removes this pressure and reinstates the profit-maximization goal that leads to efficiency improvements and innovation. Megginson and Netter (2001) review many recent empirical papers documenting that privatization is highly successful in delivering performance improvements.

So, it is not surprising that privatization constituted an important part of the reform program in the transition countries with the objective that the new private owners would quickly induce restructuring and improve performance. As Aghion et al. (1994) and Roland and Sekkat (2000) argue very intuitively, whether or not the incumbent management chooses to restructure crucially depends on the prevailing incentives. However, managers of the SOEs facing an end-game situation immediately before the privatization have an incentive to squander the enterprises assets. This threat underlay strives for fast privatization that would deprive managers of this option. Nevertheless, managers may restructure because they expect to benefit from the subsequent privatization and/or because they attempt to improve performance in order to convince the new owners of their competence and thus retain their positions after privatization. Thus, managerial career concerns motivate incumbent managers to restructure even in the pre-privatization period. Empirical evidence indicates that this is indeed the case: managers of SOEs often begun to restructure their enterprises even before the actual privatization took place (Carlin et al., 1995, Barberis et al., 1996).

The actual transfer of ownership to private hands has further efficiency-improving effects that work through two channels: first, by setting better incentives for managers, and, second, by better matching of managers and productive assets (Roland, 2000).

First, the new private owners are expected to introduce better managerial incentives – both positive and negative ones (Djankov and Murrell, 2002). Owners who do not directly participate in the day-to-day management of firm's affairs hold the top managers

[76] Possible political benefits include excess employment and wages, production of goods desired by politicians rather than by consumers, and location of production facilities in politically desirable rather than economically attractive regions.

responsible for the firm's economic outcomes. Managers who deliver satisfactory performance hold their posts, whereas those who do not are punished by termination and replacement.[77] Good performance is also rewarded by higher remuneration. Introduction and enforcement of appropriate incentives for managers is very important in transition economies since it substitutes the role of other disciplinary and motivational tools – such as competition in product, managerial and capital markets (either through takeovers or bank supervision) – that are still not functioning properly in the transition period.

Second, an effective reform must change not only the incentive environment but also provide a mechanism for appropriate supervision and replacement of managers who will be responsive to the new opportunities (Groves et al., 1995). Skills and qualifications that were important in a command economy are not necessarily useful in a market economy. Moreover, the selection of top managers under the communist regime often reflected political considerations as much as, or more than, managerial skills. In contrast, the new owners are likely to appoint managers who possess skills more appropriate for the market economy in general and their individual firm in particular.[78] In functioning market economies, this task is complemented by the managerial labour market and capital market. As the managerial labour market and capital market are not yet sufficiently developed in the transition economies, the new private owners play here a pivotal role for managerial replacements.

The privatization experience in Central and Easter Europe nevertheless shows that the relationship between transfer of ownership and improved efficiency is not straightforward. First, privatization, and especially the voucher method, often delivered owners who were unable or unwilling to exercise effective control over the privatized firms.[79] Second, flaws in or outright absence of regulation and weak enforcement of property rights often left the incumbent managers entrenched and *de facto* in control of the firm long after privatization

[77] Weisbach (1988) and Warner et al. (1988) present empirical evidence from the U.S.

[78] However, as Claessens and Djankov (2000) emphasize, due to the absence of high-quality business education, there are obvious limits with respect to skills of local managers in post-communist countries.

[79] This was often suggested in connection with the investment privatization funds in the Czech Republic who, through the voucher privatization, acquired minority stakes in dozens of enterprises. As a result, they often focused on portfolio management rather than close supervision of management of the firms.

(Earle, 1998).[80] Third, even when owners took control of the privatized firm, they sometimes found it more attractive to divert assets at the expense of minority shareholders rather than maximize the net worth of the firm (Glaeser et al., 2001, Johnson et al., 2000).

A growing body of empirical literature attempts to document the (relative) importance of the two channels: the introduction of new human capital at the top-management level and of managerial incentives. Barberis et al. (1996) analyzing data obtained from a survey of 452 Russian shops (both state owned and privatized) over the period 1992-93 find that bringing in new people with new skills is a precondition for restructuring. Only changing incentives faced by the incumbent managers does not suffice, it is the change of management and/or ownership that leads to restructuring (as their sample only includes retail shops, the change of ownership and management often coincides). Claessens and Djankov (2000) come to a similar conclusion. They investigate the effect of managerial turnover on performance of privatized Czech firms during 1993-97 and provide further evidence that appointment of new managers improves firm performance. This is especially the case when the managers were appointed by the new owners rather than the government. In contrast, they find that equity incentives (equity holdings by management) are not significantly related to firm performance.

Groves et al. (1995) analyze 769 state-owned Chinese enterprises over 1980-89 and find evidence that supports both channels through which better efficiency is achieved. In particular, poor firm performance affects the selection procedure for managerial appointments and the conditions of managerial contracts.[81] Consequently, the management contracts provided managers with incentives to maximize profits. They also find that the appointment of a new manager improves firm performance. In contrast, Frydman et al. (1998), based on their analysis of the determinants of firm performance in the Czech Republic, Hungary and Poland, argue that improvements in performance stemming from managerial turnover are not ownership-related. They find that firms privatized to outsiders

[80] For example, there is anecdotal evidence of managers and workers of privatized enterprises in Russia refusing to hand over control to new (foreign) owners and even refusing to allow them on firm's premises, often with tacit or open support from local authorities.

[81] Managers in poorly performing firms were appointed for shorter periods and were required to post a higher security deposit.

as well as state-owned firms significantly improved their performance following managerial change.

5.3 Privatization and corporate-governance regulation in the Czech Republic

The Czech government opted for a fast liberalization/reform program that aimed to introduce the three essential steps – price liberalization, stabilization and privatization – relatively rapidly (Sachs, 1993). In effect, voucher privatization introduced new private owners already in 1993 after the first wave and in 1994 after the second wave.[82] As documented in Chapter 4, despite fears of highly dispersed ownership, the post-privatization ownership structure was quite concentrated. Only around 29 percent of all firms involved in the first wave had more than 50 percent of their shares in hands of small, dispersed shareholders.[83] IPFs were the most frequent blockholders, especially in the first years after the privatization. In an average firm, as much as 25 and 31 percent of shares was in hands if IPFs immediately after the first and second wave, respectively. Thus, the IPFs played also vital role in pursuing restructuring in general and managerial turnover in particular. Still, frequent ownership transactions over the years since the privatisation have resulted in higher concentration of ownership in hands of individuals and other domestic and foreign firms who challenge the vital role of IPFs.

In order to explore the relationship between managerial turnover and firm performance, it is also important to be familiar with the specifics of the prevailing corporate governance patterns. The law restricts the design of internal-control structures in companies and thus has an important impact on the corporate governance patterns in place. In particular, the legal framework stipulates the conditions of appointment, responsibilities, and accountability of executive bodies, including the CEO.

The principal piece of legislation regulating the internal-control structures in the Czech Republic is the Commercial Code. Limited-liability public companies are obliged to have a two-tier internal-control structure. In particular, the Code prescribes that two separate

[82] For more details about the whole privatization process see the previous chapter.
[83] Ownership structure of firms privatized in the second wave had a similar pattern.

internal bodies are established: a board of directors (henceforth BoD) and a supervisory board (SB). The BoD is the highest executive body of the company responsible for all business affairs of the company. In particular, the Code stipulates that, unless regulated otherwise by the articles of association, the BoD members (and not the management) have the legal authority to sign contracts on behalf of the company. In general, members of the BoD are appointed by the general meeting of the company's shareholders. However, the articles of association may also stipulate that members of the BoD are appointed by the SB instead. The chairman of the BoD is elected by the BoD members themselves in both cases. In turn, the SB is responsible for overseeing and monitoring of the actions of the BoD. Members of the SB must be appointed by the general meeting of shareholders.[84] The Code does not regulate the role of the management.

In practice, different types of internal-control structures are common among the Czech companies. This variety of internal-control structures (relative division of control/power between SB, BoD, and management) is due to different preferences among the important individual constituencies involved: the state (represented by the Fund of National Property – FNM), investment privatization funds (IPFs), other owners, and the management (Brzica, 1995). In general, two main types prevail, with each stipulating different roles for the BoD and the SB, the relationship between them and towards the management. In the first type, depicted in Figure 5.1, the management is relatively powerful because its members also sit on the BoD (although the positions of the CEO and the BoD chairman are not necessarily taken up by the same person). The SB is elected by the general meeting of shareholders and it in turn appoints the BoD members. Thus, shareholders have their representatives on the SB, which oversees and monitors the BoD. The BoD coincides with the management team and is the executive body of the company.

The second type (Figure 5.2) is used when shareholders want to have higher control over the firm. In that case, both the BoD and SB are appointed directly by the general assembly of shareholders. Shareholders' control over the firm is then indeed quite considerable since the shareholders have their representatives on the BoD that has the ultimate responsibility over the business affairs of the firm. In contrast, the management

[84] Except for companies with more than 50 employees, in which case one third of the SB is appointed by the employees.

team (that is not part of the BoD) is relatively weak with limited responsibilities.[85] The role of the SB is limited to monitoring the activities of the BoD and the management. This type of internal-control structures is usually prevailing in firms with several IPFs. Representatives of stronger IPFs are appointed members of the BoD (effectively control the firm) and smaller IPFs are represented in the SB.

FIGURE 5.1: INTERNAL-CONTROL STRUCTURE: STRONG MANAGEMENT

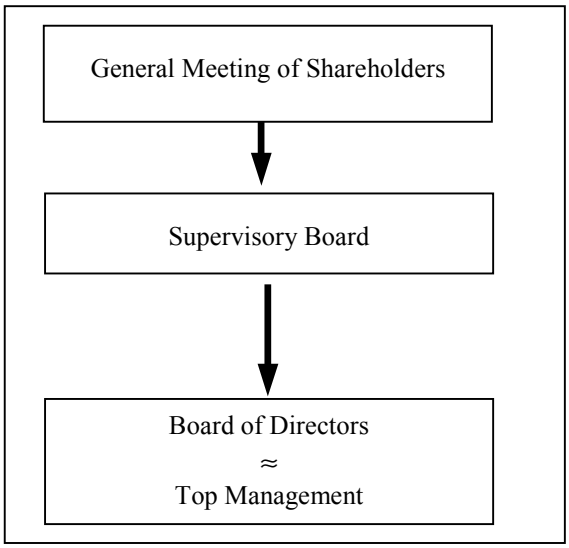
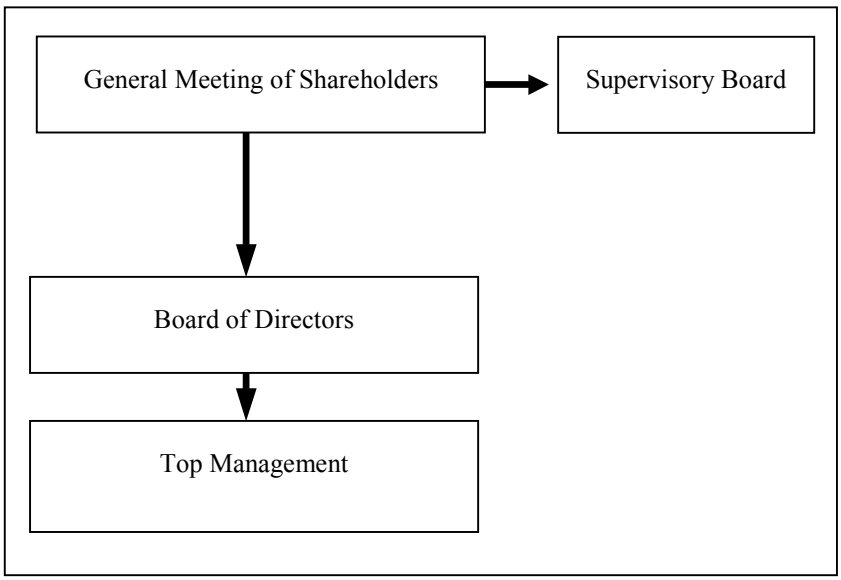


FIGURE 5.2: INTERNAL-CONTROL STRUCTURE: WEAK MANAGEMENT



[85] Sometimes is the CEO also a member if the BoD but does not hold an important position (such as that of the chairman or vice-chairman).

Since the objective of this paper is to analyze the effect of changes at the top executive level on productivity (performance), it is instructive to summarize briefly the main implications of the two alternative models discussed above for the roles of the top management and the BoD. First, the Code assigns executive power and responsibility to the BoD. Second, the members of the top management do not always sit on the BoD. Third, even when the top management and the BoD overlap, the chief executive officer is not always the chairman of the BoD. Hence, analyzing the impact of top executive turnover on firm performance, one must control for the specifics of internal-control patterns in place. In fact, such an analysis may not be complete when only considering CEO turnover, as the key responsibility for business affairs of the firm lie within the BoD and the CEO is not always member of the board.

The previous research analyzing the effects of change at the top executive level in the Czech Republic (Claessens and Djankov, 1999, 2000) abstracted from this, in our view, important aspect of the Czech corporate governance system. In the present paper, we contribute to the existing literature by taking these aspects into account. In particular, we consider changes at both posts (CEO and chairman of the BoD), and also distinguish CEO/BoD-chairman turnover in the two internal-control structures. In other words, we address the question whether it is important to change the CEO or rather the chairman of the BoD in order to achieve better productivity and whether the two systems have differing impact on top managerial turnover.

5.4 Data

We base our analysis on a panel of 917 non-financial firms privatized during the two waves of voucher privatization in the Czech Republic.[86] The data span the period from 1993 to 1998. The basic criterion for a firm to be included in our analysis was that information on its sales, fixed assets, number of employees, and costs had to be available for at least 3 years. The panel is therefore unbalanced and contains a total of 4920 firm-year observations. The data set contains also various non-economic information about the firms. Importantly, we are able to identify the firm's CEO, the date he or she assumed this

[86] The data were purchased from Aspekt Kilcullen s.r.o. (http://www.aspekt.cz/).

position as well as information on structure of ownership. The latter is based on a list of owners who hold more than 10 percent of total equity. However, ownership structure is only available starting with 1996 as only then it became obligatory by law to disclose this information.

Unfortunately, the data have some limitation too. Besides the missing information on the structure of ownership before 1996, we have no information on the CEO's professional qualifications (education, experience, and employment history within and outside the firm) or the reasons for the CEO's departure. Therefore, while we can observe CEO changes, we do not know whether the previous CEO was dismissed or whether he left for other reasons (such as health problems, retirement or death). Yet, as the descriptive statistics discussed in greater detail below show, changes within the top management and the BoD are so frequent (ranging between 10 and 24 percent per year for the CEO and between 24 and 37 percent for the chairman of the BoD) that health and demographics could only account for a small fraction of them.[87]

Table 5.1 presents basic descriptive statistics. The data indicate that sales, fixed assets and labour productivity rose slightly from 1994 until 1998 (a period during which the structure of the data set is largely stable), whereas profitability (measured by return on fixed assets) declined from 1994 until 1996 and then increased again. The number of employees was falling till 1997 and only stabilized in 1998. The fact that the average enterprise increased its sales and improved profitability while reducing the number of employees by approximately 10 percent indicates ongoing restructuring effort and hardening of the budget constraint. Comparing means and medians for most of the variables in Panel A reveals that there are several large firms in the data set. As new firms enter the data set in the wake of the second wave of voucher privatization, the average and median firm sizes fall considerably, indicating that the first wave was more strongly dominated by large enterprises.

[87] It is also not very probable that these high replacement rates were a consequence of low turnover in the pre-privatization period. In fact, Claessens and Djankov (1999) report that at least 50 percent of voucher-privatized firms in their sample replaced their CEO already in the pre-privatization period.

TABLE 5.1: DESCRIPTIVE STATISTICS

PANEL A		1993	1994	1995	1996	1997	1998
Number of firms		509	882	896	899	887	847
Total sales:	mean	1035	720	741	737	767	793
	median	308	200	211	207	208	196
	st. dev.	2945	2322	2337	2334	2387	2496
Costs of goods sold:	mean	734	557	633	662	740	786
	median	218	145	171	175	187	187
	st. dev.	1711	1595	1802	1809	2057	2262
Gross profit margin:	mean	302	214	217	219	255	284
	median	81	53	54	55	69	67
	st. dev.	1478	1101	1139	1183	1211	1342
Fixed assets:	mean	848	573	589	625	650	703
	median	217	116	118	114	103	102
	st. dev.	4326	3628	4039	4556	4921	5437
Number of employees:	mean	1253	830	796	766	739	743
	median	568	311	306	300	290	290
	st. dev.	3012	2058	1953	1952	1885	1850
Labour productivity:	mean	946	953	1063	1165	1368	1428
	median	498	537	607	665	761	774
	st. dev.	1432	1180	1215	1562	2658	2823
Return of fixed assets:	mean	0.55	0.57	0.54	0.46	0.57	0.64
	median	0.44	0.43	0.42	0.42	0.47	0.47
	st. dev.	0.67	0.68	1.14	2.36	1.81	1.23

PANEL B						
	1993	1994	1995	1996	1997	1998
Frequency of CEO change[1]	9%	8%[3]	10%	16%	24%	18%
Frequency of CBD change[1]	27%	28%	37%	35%	29%	24%
Number of firms with CEO (CBD) change per year:[2]						
	1993	1994	1995	1996	1997	1998
first CEO change	6	77	71	89	174	73
last CEO change	3	39	43	69	190	146
first CBD change	32	184	188	256	94	61
last CBD change	9	50	101	223	200	228
Percentage of firms with CEO change in n^{th} year after privatization						
year	1	2	3	4	5	6
percentage of firms	11%	18%	18%	24%	23%	6%

PANEL C	Total	CEO is BoD chairman	CEO is BoD chairman or vicechair.	CEO is BoD member
Number of firms	917	383	590	699

Notes: For each year in Panel A, the mean, median, and standard deviation are reported in given order. Sales, costs of goods sold, gross profit margin, and fixed assets are in CZK millions in constant prices of 1993. *Gross profit margin* is defined as difference between total sales and costs of goods sold. *Labour productivity* is the total sales over the number of employees. *Return of assets* is defined as the gross profit margin over the fixed assets. Only changes of CEOs and CBDs after voucher privatization (i.e. after April

1993 and October 1994 for the firms included in the 1st and 2nd wave, respectively) were considered. CBD stands for chairman of the board of directors.
[1] All changes of CEO (CBD) per firm considered.
[2] Change of CEO (CBD) is attributed to the following cal. year if it occurred during the 2nd half of the year.
[3] Partitioned for firms in the 1st and 2nd wave, the frequency is 11% and 3%, respectively.

We are primarily interested in the pattern of managerial turnover. Compared to available estimates of 7.8 percent - 9.3 percent for U.S. firms (Claessens and Djankov, 2000), the CEO turnover in the Czech Republic seems relatively high. In our sample, as much as 56.5 percent (518 out of 917) of firms replaced their CEO over the 5-6 years since privatization.[88] In most cases (345 firms), the CEO was replaced only once, in 132 firms twice, and in 41 firms three or more times. These numbers document a very turbulent managerial turnover in the post-privatization period. As Panel B of Table 5.1 shows, the frequency of CEO change has an increasing trend.[89] It is low immediately following the privatization, but increases to 24 percent in the fifth post-privatization year. This indicates that even though the new private owners were eventually quite eager to replace the top managers in their newly acquired firms, they were prepared to give them the benefit of the doubt by not replacing them immediately after the privatization. Nonetheless, it is equally plausible that it took several years until ownership structure was sufficiently consolidated and owners started to exercise their control effectively. On average, the first CEO change took place in the fourth year after the transfer of ownership in firms that replaced their CEO at least once.

The lower part of Panel B (Table 5.1) shows the actual distribution of firms over years in which the CEO change took place. Eleven percent of firms changed their CEO in the first year and the median firm changed the CEO in the fourth year. Comparing the CEO turnover to the turnover of the chairman of the BoD (CBD henceforth), the CBD is replaced much more frequently and in more firms.

Panel C looks at the incidence of the two internal-control structures discussed in the preceding section. Most Czech firms employ the first alternative of the internal-control structure with strong management. In more than a third of all firms, the CEO served also

[88] The period 1993-98 represents 6 and 5 years in the post-privatization period for the firms privatized in the first and second wave of voucher privatization, respectively. Ownership rights were transferred in April 1993 and June 1994 for the first and second wave, respectively.
[89] Note that we are interested only in post-privatization managerial changes.

as the CBD. In nearly two thirds, he was either the chairman or a deputy chairman of the BoD and in more than two thirds he had a seat on the BoD. Nevertheless, when comparing CEO and CBD changes, we find that only in 100 cases, both CEO and CBD were changed at the same time.

Table 5.2 looks at the structure of ownership by identifying the largest shareholders of the enterprises in 1996. Even though the Investment Privatization Funds were the most frequent owners of the privatized companies immediately after the voucher privatization[90], our data suggest this was no longer the case in 1996. Apparently, considerable secondary ownership transfers took place since the voucher privatization.[91] By 1996, domestic firms were the most frequent type of the largest shareholder (35 percent of firms), followed by the IPFs (20 percent) and the government (15 percent).

TABLE 5.2: OWNERSHIP STATISTICS: THE LARGEST OWNER

Type of the Largest Shareholder:	No. of firms	Percentage of firms	Avg. Ownership Share[1]	Controlling blockholder (>33.4%)[2]	Majority blockholder (>50%)[2]
Investment Privatization Fund	169	19.58%	26.25%	33	7
Domestic bank	14	1.62%	43.46%	9	4
Foreign bank	14	1.62%	40.26%	9	4
Domestic corporation	303	35.11%	45.73%	225	124
Foreign corporation	57	6.60%	60.23%	52	40
Individual	89	10.31%	34.24%	42	14
National Property Fund	126	14.60%	46.51%	85	49
Institutional investor (not IPF)	79	9.15%	36.14%	43	15
Foreign institutional investor	12	1.39%	52.41%	8	7

Notes:
[1] Percentage of shares held by the largest shareholder.
[2] Number of firms having a controlling blockholder (one who holds at least 33.4% of shares) and majority owner (holding more than 50% of shares), respectively.

Voucher privatization was expected to lead to highly dispersed ownership. Yet, as Table 5.2 shows, that is not what happened in the Czech Republic (for a more detailed discussion, see also Chapter 4). Except for the IPFs, the largest shareholder on average owns more than one third of total equity. Foreign firms in particular tend to acquire

[90] As discussed above, approximately two thirds of vouchers were invested through IPFs rather than directly in the two waves.
[91] Indeed, already during voucher privatization, large ownership changes were expected. This process was often referred to as the third wave of privatization, or re-privatization.

concentrated stakes, holding on average 60 percent of equity. The low average stakes held by IPFs in part reflect legal restrictions. The funds are prohibited from owning more than 20 percent of any company. If several funds set up by the same legal entity hold stakes in a firm (as was often the case), their joint stake is to be at most 40 percent. To circumvent this regulation, many IPFs transformed into holding companies[92]. This is documented also by our data since some of the funds own blocking or majority stakes, even though less frequently than other types of owners.

5.5 Determinants of CEO turnover

As documented in the previous section, around 57 percent of Czech enterprises experienced a change of their CEO at least once during the five/six years since their privatization. The new private owners were thus quite active in replacing the top managers of their newly acquired enterprises. In the present section, we investigate the factors that determine CEO turnover. In particular, we investigate whether the probability of CEO change is related to firm performance. Finding a negative correlation between firm performance and CEO turnover would indicate that the new owners tend to change those managers who fail to deliver satisfactory results.[93] Indeed, in the previous section we show (in Table 5.1) that the frequency of CEO change picks up considerably after 1996 (i.e. 3-4 years after privatization, depending on whether the particular enterprise was included in the first or the second wave). Apparently, the managers were given some time immediately after the privatization to show their qualities.

An alternative and *a priori* equally plausible explanation is that the new private owners replaced the incumbent CEOs regardless of performance so as to assert control over the firm and put in place management that best corresponds to the firm's needs. In this case, one would expect to find little correlation between firm performance and managerial turnover. Still another interpretation of a nonsignificant relationship between firm performance and managerial turnover is possible. In particular, high managerial control over the firm could mean that outside shareholders are not able to push forward

[92] Because of this, we retain such transformed IPFs in the IPF category.
[93] A negative relation between managerial change and prior firms performance would be in line with the practice common in market economies (see for example Warner et al., 1988, and Franks and Mayer, 1996).

changes on the top managerial positions. Thus, managerial entrenchment could lead to low managerial turnover and low (or non-existent) negative incentives. However, we argue that this is not the case in the Czech voucher-privatized firms as CEO turnover is very high and managerial entrenchment seems to be quite low. Claessens and Djankov (1999) report that the CEOs own on average only 2.5 percent of total equity, with only 1.8 percent of managers holding more than 20 percent or more. Moreover, Brzica (1995) documents exercising of ownership rights and active involvement of owners (mostly IPFs) in monitoring of their firms.

To test the importance of enterprise performance for the probability of CEO change, we estimate the following basic relationship:

$$DCEO_{it} = \alpha_i + \beta_1 Perf_{it-1} + \beta_2 Size_{it-1} + \beta_3 D_{it} + \varepsilon_{it} \quad (1)$$

where $DCEO_{it}$ is a binary variable taking value of one if the CEO of firm i was replaced in year t, $Perf_{it-1}$ is the firm's performance in the previous year, $Size_{it-1}$ is a measure of firm size in the preceding year, D_{it} is a matrix of ownership dummies (described below), α_i is the firm-specific constant, and ε_{it} is the error term. Performance and size are both in natural logarithms and are industry-adjusted (divided by the industry average in the given year). We use three measures of performance: labour productivity, gross profit margin per employee, and return on fixed assets. Size is measured, alternatively, by total fixed assets or number of employees and is included to account for the possibility that large firms have a higher frequency of managerial turnover. Equation (1) thus relates the probability of CEO change to firm performance. A negative coefficient estimated for either performance measure would indicate that low performance increases the probability of CEO replacement and, thus, negative managerial incentives are in place. The equation was estimated by logit panel regressions with fixed effects.[94]

The results reported in Panel A of Table 5.3 do not support the hypothesis of negative managerial incentives for neither of the performance measures. The effect of labour productivity on CEO turnover is insignificant and positive (Models 1 and 2 in Panel A of Table 5.3). The coefficient estimate for profit per employee in Model 3 (Panel A, Table 5.3) does have the correct sign but is also insignificant. The only significant coefficient is

[94] The Hausman test indicates that fixed effects are appropriate for our models.

TABLE 5.3: IMPACT OF FIRM PERFORMANCE ON CEO TURNOVER: PANEL RESULTS

	labour productivity		labour productivity		gross prof. per empl.		return on fixed assets	
Panel A: Panel Estimates (94-98)	**Model 1**		**Model 2**		**Model 3**		**Model 4**	
Performance (lagged)	0.092		0.123		-0.012		**0.175**	*
	(0.171)		(0.175)		(0.112)		(0.092)	
Size (lagged)			-0.210		-0.287		0.087	
			(0.180)		(0.203)		(0.334)	
Fixed effects	Yes		Yes		Yes		Yes	
Year dummies	Yes		Yes		Yes		Yes	
χ^2	93.70	***	94.35	***	89.82	***	81.20	***
Panel B: 1997 Estimates			**Model 5**		**Model 6**		**Model 7**	
Performance (lagged)			**-0.261**	**	**-0.216**	*	-0.001	
			(0.191)		(0.114)		(0.089)	
Size (lagged)			**0.099**	*	0.077		0.089	
			(0.059)		(0.060)		(0.083)	
constant			**-1.097**	***	**-1.108**	***	**-1.115**	***
			(0.093)		(0.094)		(0.098)	
Fixed effects			Yes		Yes		Yes	
χ^2			6.18	**	4.07		1.13	

Notes: Estimated with logit regressions, standard deviations are in parentheses. Number of observations is 4105. The dependent variable is a binary variable equal to one if CEO changed in the respective year. All variables are industry adjusted and in logs. *Labour productivity* is defined as the total sales over the total number of employees. *Gross profit per employee* is defined as the total sales less the costs over the total number of employees. *Return on fixed assets* is the total sales less the total costs over the fixed assets. *Size* stands for the fixed assets in Models 1-3 and the number of employees in Model 4. Year 1994 is the reference year. * denotes significance at the 10% level. ** denotes significance at the 5% level. *** denotes significance at the 1% level.

that obtained for return on fixed assets in Model 4 but it is positive, implying that good performance increases the probability of the CEO turnover.

Panel B of Table 5.3 reproduces Models 2-4 with data only for 1997 so as to facilitate comparison with results that incorporate ownership information discussed bellow.[95] Note (see Table 5.1) that 1997 was the year with the highest frequency of managerial turnover which may influence the results. The results in Panel B differ substantially from those in Panel A. It appears that negative incentives did play an important role in determining CEO changes during 1997 – both labour productivity and profit per employee are negative and significant whereas return on fixed assets is now insignificant. This pattern, however, only

[95] Ownership data is available only since 1996. Therefore, we can only use ownership (and performance) in 1996 to explain CEO turnover in 1997.

obtains for CEO changes in 1997. The results for analogous regressions with CEO change in other years show insignificant coefficients for all performance variables.[96] Thus, we find some indication that negative incentives determine managerial turnover but only in 1997. In the remaining years, it appears that if the new private owners replaced the CEOs, they did largely regardless of their performance. Nevertheless, this result may stem from the fact that the new owners needed some time to get acquainted with their firms, gather information and let the incumbent managers to show their abilities. Therefore, performance may become important only later on which is consistent with our results.

Next, we explore whether different types of owners behave differently when it comes to CEO turnover. We conjecture that only blockholders with significant control who are involved in active monitoring have direct access to inside information concerning firm value and abilities of the management. Therefore, owners who do not closely monitor the firm's activities are more likely to rely on performance as a signal about the CEO's competence. We categorize the enterprises according to the type of the largest owner. In doing so, we consider also the size of the stake held by the largest stakeholder. We distinguish between a *controlling blockholder* (defined as one holding at least 33.4 percent of equity) and a *majority blockholder* (one with more than a 50 percent stake). These two thresholds were chosen so as to account for the relative control power of the largest stakeholder. Obviously, a blockholder who is in possession of more than 50 percent of outstanding equity is in almost complete control of the enterprise. As the Commercial Code requires a two-third majority to implement certain important corporate decisions, owning more than a third of total equity also implies considerable influence (such stake is often denoted as a blocking majority).

Within these two size categories, we further distinguish between six different types of stakeholders: investment privatization funds (IPFs), banks, other financial institutions, individuals, corporations, and the national property fund (NPF). The empirical literature analyzing ownership/control effects of different types of owners usually distinguishes ownership by individuals, corporations, and financial institutions (Holderness and Sheehan, 1988). We augment these basic groups by adding the NPF, as the state ownership is till important in the Czech Republic. Further, we partition financial

[96] These results are not reported here, they are available upon request.

institutions into the IPFs, banks, and the remaining financial institutions. As coding ownership structure is very time consuming and ownership data is available only since 1996, we only investigate the effect of performance and ownership structure in 1996 on CEO change in 1997. This is the year with most frequent CEO changes and, as reported above, the only year during which the relationship between performance and managerial turnover was found to be positive.

Regressions reported in Table 5.4 investigate the effect of different types of controlling and majority blockholders on the probability of CEO change. In order to test the performance-CEO turnover relation for the different types of controlling/majority blockholders, we augment the basic models from Table 5.3 by a set of interaction terms between the individual performance measures and the controlling/majority-blockholder types. This specification allows us to test whether different types of owners put different

TABLE 5.4: IMPACT OF FIRM PERFORMANCE IN 1996 ON CEO TURNOVER IN 1997

	labour productivity		gross prof. per empl.		return on fixed assets	
Panel A: Controlling blockholder	**Model 1**		**Model 2**		**Model 3**	
Constant	**-1.123**	***	**-1.120**	***	**-1.091**	***
	(0.098)		(0.099)		(0.102)	
Performance (lagged)	-0.220		**-0.297**	*	0.067	
	(0.172)		(0.169)		(0.153)	
Size (lagged)	0.076		0.067		0.107	
	(0.064)		(0.065)		(0.088)	
Interaction terms[1]						
perf.*IPF	**-1.330**	**	-0.206		**-1.003**	**
	(0.621)		(0.654)		(0.410)	
perf.*bank	0.285		2.080		-0.381	
	(0.874)		(1.342)		(0.460)	
perf.*corporation	0.233		0.247		-0.038	
	(0.251)		(0.253)		(0.222)	
perf.*individual	0.015		-0.399		0.052	
	(0.477)		(0.542)		(0.450)	
perf.*National Property Fund	-0.524		0.482		0.436	
	(0.433)		(0.514)		(0.414)	
perf.*institutional investor (not IPF)	-0.304		0.013		0.171	
	(0.567)		(0.445)		(0.429)	
Number of observations	846		812		728	
χ^2	14.17	*	8.36		10.93	

Table 5.4 continued

Panel B: Majority blockholder	**Model 4**		**Model 5**		**Model 6**	
Constant	**-1.126**	***	**-1.148**	***	**-1.093**	***
	(0.099)		(0.100)		(0.103)	
Performance (lagged)	**-0.290**	**	**-0.327**	**	0.041	
	(0.138)		(0.140)		(0.114)	
Size (lagged)	0.082		0.058		0.107	
	(0.064)		(0.065)		(0.089)	
Interaction terms[2]						
perf.*IPF	-4.040		-0.375			
	(2.961)		(1.018)			
perf.*bank	-0.300		1.470		-0.363	
	(1.857)		(1.604)		(0.746)	
perf.*corporation	**0.521**	*	0.440		-0.069	
	(0.296)		(0.277)		(0.240)	
perf.*individual	-0.808		-0.929		0.943	
	(0.856)		(1.123)		(1.156)	
perf.*National Property Fund	-0.212		**1.317**	**	0.654	
	(0.500)		(0.607)		(0.685)	
perf.*institutional investor (not IPF)	-0.398		0.093		0.645	
	(0.781)		(0.869)		(0.726)	
Number of observations	846		812		722	
χ^2	13.52	*	11.13		4.75	

Notes: Estimated by Logit. The dependent variable is a binary variable equal to one if CEO changed in 1997. Ownership information, firm performance, and size pertain to 1996. *Labour productivity* is defined as the total sales over the total number of employees. *Gross profit per employee* is defined as the total sales less the costs over the total number of employees. *Return on fixed assets* is the total sales less the total costs over the fixed assets. *Size* stands for the fixed assets in Models 1-2 and 4-5 and the number of employees in Model 3 and 6. All variables are industry adjusted and in logs.

[1] The interaction term equals performance measure multiplied by the controlling blockholder-type dummy that equals one if the corresponding type holds at least 33.4% of equity

[2] The interaction term equals performance measure multiplied by the majority-type dummy that equals one if the corresponding type holds more than 50% of equity

* denotes significance at the 10% level. ** denotes significance at the 5% level. *** denotes significance at the 1% level.

weight on past performance when deciding whether to dismiss the CEO. Panel A reports regression results for controlling blockholders and Panel B for majority blockholders.

In Panel A of Table 5.4, we estimate the effect of controlling blockholders (that is, owners holding at least a blocking majority stake of 33.4 percent). Again, we use three different measures of performance: labour productivity (Model 1), gross profit per employee (Model 2) and return on fixed assets (Model 3). The only ownership variable that is significant (in two regressions out of the three) is the one for IPFs – enterprises that have an IPF as a controlling blockholder are more likely to replace their CEO after poor

performance. After controlling for ownership effects, the coefficient on labour productivity (Model 1) becomes (tough it remains negative) insignificant for the reference category – firms without a controlling blockholder. Apparently, the negative relation between labour productivity and CEO turnover documented in Panel B of Table 5.3 is largely due to the behaviour of IPFs in controlling-blockholder positions.[97] For other ownership types, labour productivity in previous year does not seem to influence CEO turnover.

Panel B of Table 5.4 – where we analyze the impact of majority ownership categories on the relationship between performance and CEO turnover – provides a different picture. The interaction term for the IPF presence turns insignificant, which is probably due to the fact that only a few enterprises have an IPF holding more than 50 percent of equity. This conclusion is supported also by the fact that the plain coefficient estimate for labour productivity is significantly negative in Model 4 whereas it is not significant in Model 1 (in Panel B, the reference category now includes also firms that have a controlling blockholder as the largest owner but not a majority blockholder). In contrast, the coefficient estimate for corporate ownership is positive in two regressions and significant when performance is measured with labour productivity. A similar pattern obtains for firms that are majority owned by the NPF – again, the coefficient on performance is positive in two regressions and significant in the one with profit per employee. All other ownership types have a negative but insignificant coefficient indicating that lower-than-average labour productivity increased the probability of CEO change (because the coefficient estimated for performance is negative and significant for labour productivity and profit per employee). The exceptions are thus firms majority-owned by the government or corporations.

The results in Model 5 (Table 5.4) for profit margin per employee show that low profitability enhances chances for CEO turnover for non-majority owned firms (coefficient of –0.327). This relationship disappears for firms with majority ownership.[98]

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[97] Not reported regression results indicate that the IPFs and individual stakeholders with a controlling stake change their CEOs more often.

[98] This result is confirmed in an unreported regression with one interaction term between profit margin per employee and a dummy variable for all majority owners. The corresponding coefficient is 0.46 and is significant at the 10 percent level. The overall performance effect of majority ownership is then 0.13 (0.46 – 0.33) and is insignificant.

This result indicates that owners with relatively less power (non-majority-owned) tend to rely on negative managerial incentives more than majority blockholders who may be more involved in monitoring of their firms and may have more information on what suits their companies the best. As Model 6 provides very little explanatory power, we conclude that return on fixed assets is not an important performance measure in the Czech setting.

In summary, the evidence concerning the reasons behind CEO turnover in privatized Czech companies is mixed. The panel results covering the period from 1993 to 1998 (in Table 5.3) do not support any relationship between CEO change and prior firm performance. The results for managerial changes in 1997, the year when managerial changes were the most frequent, however, indicate that poor past performance (productivity and profitability) do have significant effect on the CEO change. The results are especially strong for non-majority-owned firms and firms owned by the IPFs. Yet, in the remaining years, it appears that the probability of CEO turnover is not increased by poor performance.

5.6 Does CEO turnover improve performance?

In the previous section, we analyze the relationship between prior performance and managerial turnover in a cross-section of firms. Another important issue pertaining to CEO turnover is whether changes at top managerial posts succeed in delivering better performance. Groves et al. (1995) argue that significant improvement in firm performance after the managerial change may reveal the existence of unfulfilled potential of the firm prior to the change of management. In other words, ex post improvement is potential evidence on ex ante poor managerial performance. The private owners may have superior information on performance of the incumbent managers and replace them when there is potential for improvement. To analyze this hypothesis, we estimate the following production function:

$$Y_{it} = \alpha_i + \beta_1 K_{it} + \beta_2 L_{it} + \beta_3 DCEO_{it} + \varepsilon_{it} \qquad (2)$$

where Y_{it} stands for the total sales of firm i in year t, K_{it} is the firm's capital (fixed assets), L_{it} is the number of employees, α_i is the firm-specific intercept (fixed effect) and ε_{it} is the

error term. Sales, capital and the number of employees are all industry adjusted (divided by the industry mean of the variable in the respective year[99]) to account for industry-specific factors and are all in natural logarithms.

The variable of interest is $DCEO_{it}$, which is a dummy variable taking value of one following the change of the firm's CEO. More specifically, the dummy is set to one in the year when the change occurred if the change took place before the end of June of that year, otherwise, the dummy is set to one in the subsequent year. Then, the dummy remains set to one henceforth.[100] That is, we assume that the impact of the CEO change is a permanent shock rather than a temporary one. A positive coefficient estimate of β_3 thus would imply that managerial turnover causes a positive shift in a firm's total factor productivity and vice versa for a negative coefficient. Note that we only consider the first post-privatization CEO change. We believe the first change is crucial because, unlike the subsequent ones, the first CEO change embodies the transfer of ownership and assumption of control by the new owners. While subsequent CEO turnover may also affect productivity, the first post-privatization change is likely to have the strongest impact.

As emphasized in Section 5.4, the institutional framework – in particular the nature of internal-control structures in place – is likely to affect the relationship between CEO turnover and productivity. Therefore, besides estimating equation (2), we consider an augmented production function with additional controls: a dummy measuring change of the board-of-directors (BoD) chairman, a dummy distinguishing the two forms of internal-control structure and interaction terms between the two turnover dummies and characteristics of the prevailing internal-control structure. The augmented production function then takes the following form:

$$\begin{aligned} Y_{it} &= \alpha_i + \beta_1 K_{it} + \beta_2 L_{it} + \beta_3 DCEO_{it} + \beta_4 DCBD_{it} \\ &+ \beta_5 DCEO_{it} * STRONG_i + \beta_6 DCBD_{it} * STRONG_i + \varepsilon_{it} \end{aligned} \qquad (2')$$

where $STRONG_i$ stands for a dummy variable equal to one if the CEO is strong (i.e. the CEO is simultaneously the chairman or deputy chairman of the BoD). We use this variable as a proxy for the first type of internal-control arrangements of firms depicted in Figure

[99] Groves et al. (1995) also follow this procedure.
[100] Note that the change-of-CEO dummy is defined somewhat differently here compared to the previous subsection.

5.1. $DCBD_{it}$ is a dummy variable indicating change of the chairman of the BoD and is defined analogously to $DCEO_{it}$.

Table 5.5 presents regression results based on Equations (2) and (2'), estimated with firm-specific fixed effects and year dummies.[101] Model 1 includes only the dummy for the change of CEO. In Model 2, in contrast, the CEO change dummy is interacted by the dummy for strong management, so that it only counts changes of CEO when the CEO has a strong position in the firm. Model 3 combines the two specifications. We denote the CEO as *strong* when he also holds the position of the chairman or deputy chairman of the BoD as these are the key control positions with legal responsibilities for the firm's actions.[102]

In Models 1 and 2, CEO turnover leads to better subsequent performance but the effect is statistically significant only when the CEO is strong. Thus, the institutional framework is indeed important – replacing a CEO who does not hold real executive power, not surprisingly, does not affect firm performance significantly. In contrast, replacing a *strong* CEO raises total factor productivity on average by 5.5 percent (note that because of the way how the CEO change dummy is constructed, this is the average *permanent* gain over all subsequent years).

Model 3 again introduces the interaction term between CEO change and the internal-control structure in the firm, this time alongside the CEO-change dummy. Hence, the coefficient estimated for the CEO-change dummy indicates the effect of CEO turnover in firms without a strong CEO, whereas the coefficient for the interaction term captures the additional effect of replacing a strong CEO. Again, CEO change does not deliver significant increase in performance unless the CEO enjoys a relatively strong position. The measured effect of replacing a strong CEO is again more than 5 percent.[103] In short,

[101] The Hausman test indicates that fixed effects are appropriate in these models.
[102] Defining the *strong CEO* as one who is simultaneously a member of the BoD (i.e. not necessarily chairman or deputy chairman) leads to almost identical results, though the significance of the interaction term is slightly lower.
[103] The magnitude of the strong-CEO effect can be computed as the sum of coefficients corresponding to the CEO dummy and the interaction term.

post-CEO-change productivity is higher only in firms where the CEO has a relatively powerful position.[104]

TABLE 5.5: IMPACT OF CEO/CBD TURNOVER ON PRODUCTIVITY, 1993-98

Panel A	**Model 1**		**Model 2**		**Model 3**	
Capital (fixed assets)	**0.351**	***	**0.349**	***	**0.349**	***
	(0.017)		(0.017)		(0.017)	
Labour (# employees)	**0.534**	***	**0.534**	***	**0.533**	***
	(0.030)		(0.030)		(0.030)	
Change of CEO	0.023				-0.020	
	(0.020)				(0.028)	
Change of CEO * strong CEO			**0.055**	**	**0.072**	**
			(0.024)		(0.033)	
Fixed effects	Yes		Yes		Yes	
Year Dummies	Yes		Yes		Yes	
R^2	0.73		0.73		0.73	
Panel B	**Model 4**		**Model 5**		**Model 6**	
Capital (fixed assets)	**0.348**	***	**0.347**	***	**0.349**	***
	(0.017)		(0.017)		(0.017)	
Labour (# employees)	**0.530**	***	**0.531**	***	**0.532**	***
	(0.030)		(0.030)		(0.030)	
Change of CEO			0.003			
			(0.030)			
Change of CEO * strong CEO			0.031		0.039	
			(0.038)		(0.025)	
Change of CBD	-0.040		-0.035			
	(0.025)		(0.027)			
Change of CBD * Strong CEO	**0.083**	***	**0.071**	**	**0.043**	**
	(0.027)		(0.031)		(0.022)	
Fixed effects	Yes		Yes		Yes	
Year Dummies	Yes		Yes		Yes	
R^2	0.73		0.73		0.73	

Notes: Estimated by OLS, fixed effects included in both regressions. Standard deviations are in parentheses. Number of observations is 4920. The dependent variable is the total sales. Sales, capital and labor are industry adjusted and in logs, sales and capital are in constant prices of 1993. *CBD* stands for chairman of the Board of Directors. The dummy for *CEO (CBD) change* equals one in the year of the first post-privatization change and in all subsequent years. *Strong CEO* dummy is equal one in firms where the CEO is at the same time also a chairman or a deputy chairman of the BoD.

Panel B of Table 5.5 presents results obtained with various permutations of the augmented production function depicted in Equation (2'). Model 4 reports results of a

[104] It should be noted, however, that the choice of particular internal-control arrangement could be a consequence of power division between shareholders. Thus, one should ideally control also for ownership structure. Unfortunately, we have ownership data starting only in 1996.

regression that only considers changes at the post of the chairman of the BoD. The results are analogous to those for CEO turnover. Replacing the BoD chairman increases (total-factor) productivity only when top management and the board of directors are closely interconnected. The measured impact on productivity is slightly lower now, on average 4.3 percent. In contrast, replacing a BoD chairman who holds executive powers but does not actively participate in day-to-day management of the firm's affairs has little effect (the coefficient is in fact negative, although it is not significant).

Model 5 reports results of a regression that considers changes at both posts, CEO as well as BoD chairman (note that even when the CEO is simultaneously also the BoD chairman, a change at one post does not necessarily stipulate a change at the other).[105] Only replacing the BoD chairman when management is strong has a significant effect on productivity. This finding is confirmed also by the regression reported as Model 6, which only counts changes at the posts of CEO and BoD chairman with strong management. This is in line with the logic of the legal framework – executive authority rests with the board of directors, not the management. Replacing the BoD chairman shifts productivity again by approximately 4 percent in Models 5 and 6.

At this point, it is important to highlight again that the CEO change (and BoD chairman) dummy we have used throughout our analysis measures the effect of the first CEO (BoD chairman) change in a given company. In order to check for consistency of our results we re-estimated all models using a dummy that measures the last CEO change. The results remain basically unchanged. The same applies to the BoD chairman dummy.

In summary, our results suggest that changes in top managerial positions and in the board of directors improve enterprise productivity only when the management is relatively strong and is closely linked with the BoD. When comparing the impact of replacing the CEO and the BoD chairman, we find that only the latter causes a significantly positive shift in (total-factor) productivity. In contrast, replacing either the CEO or the BoD chairman does not improve productivity when the management is relatively weak and separate from the BoD.

[105] In fact, only in 10 percent of CEO changes the same person was dismissed from the post of CBD at the same time.

5.7 Conclusions

In this chapter, we analyze the economic background of CEO changes in voucher-privatized enterprises in the Czech Republic immediately after the transfer of ownership. The analysis is carried out with a panel of 917 Czech corporations privatized by the voucher method, with the data spanning the period from 1993 to 1998, that is, the first 6 years after their privatization. The results are threefold. First, the evidence concerning the relation between prior performance and top managerial turnover in the newly privatized firms is mixed. We find that across the entire data set, past firm performance does not significantly affect the probability of CEO change. Nevertheless, performance effect turns out significant as a determinant of CEO changes in 1997, some 3-4 years after the privatization, especially in firms without concentrated control and those with IPF ownership. This may stem from the fact that more concentrated stakeholders are more involved in running of their companies and have, consequently, more information concerning qualities of the incumbent managers. Thus, they may replace their managers when there is a potential for performance improvement even though the firm's relative performance (compared to other firms in the same industry) does not suggest underperformance. Our second finding confirms this proposition. When comparing productivity before and after managerial change, we find that CEO change indeed delivers a positive shift in (total factor) productivity. This suggest that the new private owners act on their superior information regarding the unfulfilled potential for efficiency improvement of their firms and are able to appoint managers whose human capital better matches the firm's productive assets. Finally, our third result is that the positive effect of CEO turnover is significant only when the CEO has a relatively strong position within the firm and is closely linked with the board of directors (which is ultimately responsible for all business affairs of the company). When considering turnover at the position of the chairman of the board of directors, our findings are similar – change of the BoD chairman improves productivity only when the BoD and management are closely linked. In contrast, replacement of the CEO or chairman of the board does not improve productivity when the management is relatively weak and is not part of the BoD which assumes the executive power. In short, this chapter provides evidence that the newly established owners in the

former SOEs in the Czech Republic are active in looking for new managers with better human capital who, consequently, improve productivity of their firms.

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Chapter 6
Channels of Restructuring in Privatized Czech Companies*

6.1 Introduction

The ultimate objective of economic reforms in transition countries of Central and Eastern Europe has been to put in place a functional market system, increase production efficiency and improve living standards of its citizens. One of the principal areas of the reforms has been enterprise restructuring. That is, introduce and complete the process that transforms the unviable, loss making planned-economy enterprises into vigorous, competitive entities, the process that enables firms to operate successfully in a market economy (Ernst, 1996).

This is, in fact, an extremely complex process that is not entirely unique to companies in transition. Companies all over the world constantly face the challenge of maintaining their efficiency, competitiveness, and profitability. They are constantly under pressure to improve and restructure in order to survive (Demsetz, 1983). Why is then restructuring of the former state-owned enterprises (SOEs) in transition so special? First of all, the extent of distortions in the SOEs after the era of the planned economy is incomparable to problems experienced in private firms in a functioning market economy. Managers of the

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SOEs in a command economy were facing incentive schemes that have not motivated them to maintain profitability and adjust production towards the efficient frontier. Consequently, a restructuring of immense magnitude has been needed in the SOEs across the region. Furthermore, all these adjustments ought to be done simultaneously within a relatively short period of time. This time concentration of restructuring in a majority of firms in the region makes the process even more complicated and complex with significant macroeconomic consequences. Finally, managers and new private owners of the former SOEs do not often possess enough experience, expertise, and financial resources to carry out such an important, difficult, and multidimensional task like the restructuring of an old command-economy dinosaur. These three attributes make the restructuring process in transition unique and motivate many researchers to explore it and gain new knowledge.

At the onset of the reforms, the sequencing of reforms especially that of privatization and restructuring was the focus of discussions. Experience with privatization projects in the Western Europe showed convincingly that private enterprises perform better than state owned enterprises (Hutchinson, 1991, Megginson et al, 1994, Shleifer and Vishny, 1994). This evidence motivated, on the one hand, the advocates of a big bang approach (Lipton and Sachs, 1990, Blanchard et al., 1991), who argued that only private ownership would put in place proper incentives for enterprises to restructure. Therefore, they stressed the importance of speedy privatization. On the other hand, the supporters of a gradual reform (Roland, 1994, among others) insisted that privatization per se is not the remedy for the problems of the SOEs. Accordingly, while privatization is important, a healthy financial system imposing hard-budget constraints on the enterprises is a necessary prerequisite of enterprise restructuring.

Several studies focused on the strategies that SOEs followed in order to survive and become competitive (see, for example, Grosfeld and Roland, 1995, Carlin and Landesmann, 1997). Case-study evidence (Carlin et al., 1995, Barberis et al., 1996, Aghion et al., 1994) documents that the SOEs pursued some restructuring already in the pre-privatization period. It helped them to cope with the bad existing situation. The evidence indicates that managers of these enterprises undertook measures to reduce costs.

However, arguments were raised that this was just an adjustment[106] instead of forward-looking 'real' restructuring (Blanchard, 1997). The latter type of restructuring, also called strategic or deep restructuring, entailing activities based on a 'thoughtful business strategy leading to a profound redeployment of assets' (Grosfeld and Roland, 1995) was found only in companies privatized by a foreign investor (Carlin and Aghion, 1996).

Frydman et al. (1999) analyzing the effect of privatization in three Central European economies (the Czech Republic, Hungary, and Poland) argue that what matters is not only privatization as such, but also the type of owner to whom it gives control. In particular, when the effect of privatization in general is measured, one reaches the misleading conclusion that privatization in itself is good for the enterprises. However, distinguishing particular types of owners reveals that only foreign investors and private domestic financial firms perform better than state. To the contrary, insiders do not perform better than the state.

The literature dealing with the activities of firms after privatization focuses almost exclusively on the relationship between improved performance on the one hand, and ownership structure, on the other (Claessens, 1997, Earle, 1998, and Djankov and Murrell, 2002, among others). The general conclusion of the studies is again that privatization per se is not enough in order to secure improved performance. Foreign ownership proved to consistently outperform the other types of private investors. The common approach of these papers is that they regress some measure of performance on ownership or ownership-concentration dummies. Thus, they document the relationship between particular types of new owners and (improved) performance. To my knowledge, however, none of the studies so far, tried to analyze what it is that the successful types of owners do that distinguishes them from the unsuccessful owners. In this paper, I would like to document the restructuring activities in firms after privatization and, in particular, show which specific restructuring activities induced improved performance of the firms.[107] The need to explore the sources of restructuring was stressed, for example, by Earle and Estrin (1998).

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[106] These activities are also referred to as defensive of reactive restructuring (Grosfeld and Roland, 1995 and Carlin and Aghion, 1996, respectively).

[107] Zemplinerova, Lastovicka, and Marcincin (1995) studied restructuring activities of firms in their sample. However, majority of the firms studied were SOEs preparing for the voucher privatization.

This paper analyzes the channels of restructuring in a panel of 750 former SOEs privatized in the Czech voucher privatization. It identifies the activities, which have had a positive effect on productivity (performance) of the former SOEs since 1993, the year of the transfer of ownership rights after the first wave of the voucher privatization, until 1998. The main findings of the present analysis are fourfold. First, asset sale, employee incentives, and CEO change are associated with improvements in enterprise productivity. Second, fixed asset investments of the SOEs have negative effect on productivity. Third, availability of bank loans does not have any effect on productivity, which can be interpreted as indication of soft budget constraint imposed on the companies. Finally, the results do not offer any support for presence of efficient inventory management in the companies.

The paper is organized as follows. In the following section, the aggregate developments with respect to restructuring in the Czech Republic are reviewed. The hypotheses about potential restructuring channels are discussed in Section 6.3. The data are introduced in Section 6.4. Sections 6.5 and 6.6 discuss methodology and main results, respectively. Whereas Section 6.7 concludes and outlines suggestions for further research.

6.2 Aggregate developments in the Czech Republic

The transfer of ownership from state to private hands together with increased competition and the hardening of the budget constraint have long been regarded as the major determinants of enterprise performance and efficiency. The disciplining role of these three mechanisms was acknowledged not only for market economies, but even more so for transition economies (Earle and Estrin, 1998). Therefore, the reforms were designed as to accomplish the liberalization of prices and trade, the reduction of state subsidies and bailouts and also the privatization of SOEs.

In the Czech Republic, price and trade liberalization was introduced early in the transition process. According to the EBRD Transition Report 1998, the Czech Republic,

along with Hungary, has progressed furthest in term of overall liberalization, reaching an average liberalization index of 3.63.[108]

Privatization policy also reflected the government's commitment to the reforms. As documented in Chapter 4, the privatization program resulted in a swift transfer of property rights. In the period from 1990 till 1993, a centralized economy with 96.7 percent of output produced by SOEs was transformed into an economy with 67 percent of output produced by 'private' firms. However, many doubts have been expressed about the ability of new owners, predominantly investment privatization funds, to improve performance of the former SOEs. As Coffee (1996) points out, many of the most important IPFs acquired a stake in the main Czech banks, which in turn controlled the IPFs. This phenomenon resulted in a strange and non-transparent system of cross-ownership between the major banks and the IPFs. Furthermore, the IPFs were regarded as neither the optimal nor final owners because of their lack of access to finance for restructuring and inadequate expertise (Carlin and Aghion, 1996), and therefore additional reshuffling of ownership was said to be desirable.[109]

The implementation of the hard-budget constraint is ambiguous. On the one hand, state subsidies were abolished early in the transition process. On the other hand, the government's policy toward bankruptcies and bank-bailouts was rather 'soft.' First, the incidence of bankruptcies in the Czech Republic has been very low compared to Hungary or Poland. The government evidently protected insolvent firms against bankruptcy. Second, the problems of large state banks with high ratio of classified loans were solved by state bailouts rather then by bank privatization. Hence, the credit policies of major banks did not harden the budget constraint of the SOEs, rather the opposite was the case.

In contrast to Poland and Hungary, no particular restructuring program was implemented. It was generally expected that changes in ownership together with increasingly competitive environment would evoke and improve efficiency. Consequently,

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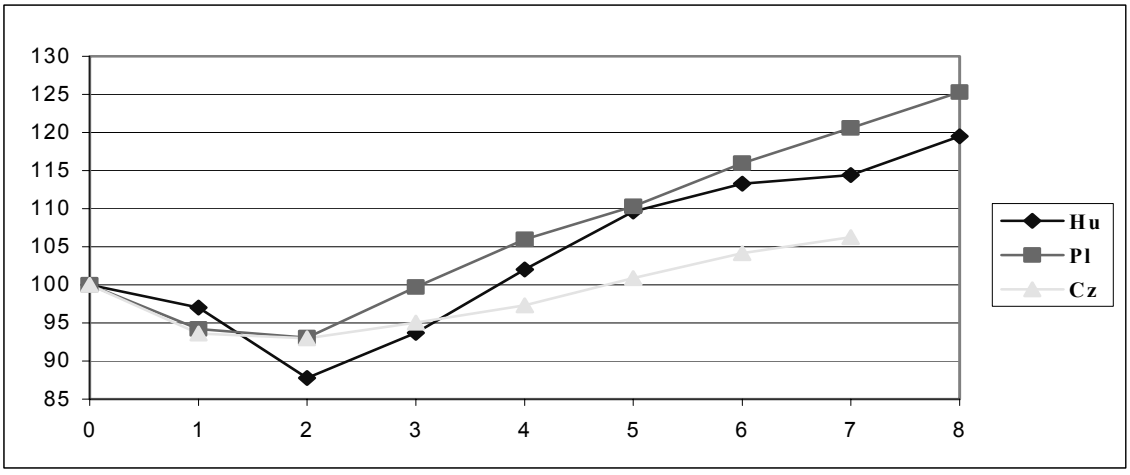
[108] The EBRD assesses progress in eight areas: large-scale and small-scale privatization, governance/enterprise restructuring, price liberalization, trade and foreign exchange liberalization, competition policy, banking reform and securities markets. The indicators take values from 1 (little progress) to 4+ (comparable to developed industrial economies). The figure reported above was computed as simple mean of the EBRD progress-in-transition indicators, ranging from 1 to 4+, with 4+ replaced by 5 for the computation of the means.

[109] Nevertheless, Chapter 5 indicates that the new private owners were able to introduce new top management that improved their firm's performance.

two questions arise. First, how has the Czech economy performed relative to the other leading transition economies in Europe? Second, has privatization alone been sufficient in achieving effective ownership structures leading to deep restructuring in the Czech Republic? In the present study, the latter question is addressed. Nevertheless, although the former question is not the subject of this paper, it is informative to look at the development of some aggregate economic indicators in the Czech Republic, and compare it to the development in Hungary and Poland.

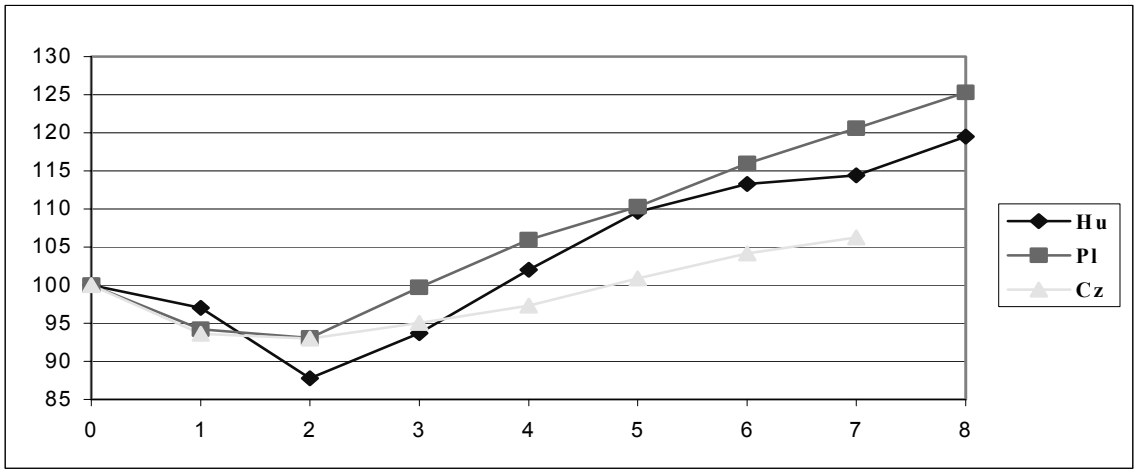
Figure 6.1 shows the evolution of real GDP in the three countries. In order to get the correct perspective**,** time was measured as the number of years since the beginning of reforms. For Poland and Hungary, 1990 is considered to be the first year of transition, whereas 1991 is the starting point for the Czech Republic (cf. Blanchard, 1997). During the first years of transition, the Czech economy was performing relatively well. GDP did not drop as low as in the other two countries, and started to recover in the third year, in 1993. However, GDP growth has deteriorated in the more recent years, in particular, since 1996. Moreover, it became negative in 1998. In contrast, the Polish economy has experienced more dynamic growth.

FIGURE 6.1: DEVELOPMENT OF GDP



Notes: In constant prices of 1990. 1990 is considered to be the first year of transition in Poland and Hungary, 1991 in the Czech Republic. Correspondingly, GDP in 1989 = 100% in Poland and Hungary; GDP in 1990 = 100% in the Czech Republic.

FIGURE 6.2: AGGREGATE LABOUR PRODUCTIVITY DEVELOPMENT



Notes: In constant prices of 1990. 1990 is considered to be the first year of transition in Poland and Hungary, 1991 in the Czech Republic. Correspondingly, GDP per worker in 1989 = 100% in Poland and Hungary; GDP per worker in 1990 = 100% in the Czech Republic.

Figure 6.2, giving the evolution of aggregate labour productivity,[110] might indicate the reason for low dynamics of Czech GDP growth. Czech aggregate labour productivity performance was poor when compared to Poland and Hungary. This suggests that firms across the Czech Republic have not been as flexible in terms of labour shedding as firms in the two other countries. The poor labour productivity growth in the Czech Republic perhaps reflects soft governmental policy towards bankruptcies and bank bailouts as well as low bank discipline.

Also, the development of fixed capital formation has not been as dramatic in the Czech Republic as in Hungary or Poland. This might suggest low long-term orientation, and hence low level of restructuring in the Czech Republic.

6.3 Enterprise restructuring: hypotheses and previous evidence

The aggregate data discussed in the previous section suggest that the Czech economy encountered some problems, which led to a slow down of its aggregate output and labour productivity growth since mid 1994. Many observers believe that one of the main reasons

[110] Aggregate labour productivity was computed as GDP in constant prices divided by the number of employed people in the economy.

behind the slow down of transformation is slow microeconomic restructuring (Dlouhy, 1999). In order to provide more profound conclusion about the extent of restructuring at the micro level, it is necessary to examine firm level data.

Earle and Estrin (1998, p. 14) point out that, *"[t]he impact of competition, ownership, and budget constraints on labour productivity may [...] work through several channels, including actions to enhance efficiency by reducing input waste, to increase sales [...], and to augment the quantity and quality of the capital stock and improve the technology through new investment."* To identify these channels in the privatized Czech SOEs is the main aim of the present paper. In particular, the paper identifies restructuring activities the new private owners pursue in order to induce higher productivity of their companies.[111] In other words, the paper provides answer to the question whether certain patterns of restructuring activities prevail in successful firms as opposed to poorly performing firms. The production function framework augmented by additional variables measuring the effect of restructuring activities is used for this purpose.

Studies on enterprise restructuring in transition (e.g. Carlin et al., 1995, Grosfeld and Roland, 1995, and Pohl et al., 1997) document that companies have engaged in a wide variety of restructuring activities before as well as after privatization. In order to simplify the analysis and to generalize the findings, Carlin et al. (1995) handle restructuring as actions taken along four main dimensions. The first dimension entitled internal organization encompasses activities associated with getting rid of unproductive assets, such as unbundling and shedding of social assets (e.g. social housing, catering, or day-care facilities). The second dimension groups activities concerning employment policies (e.g. labour shedding, wage differentiation), the third dimension concerns output-related activities, such as introduction of a marketing department, changes in product mix. Finally, the fourth dimension concerns new investment into productive assets (e.g. in wholesale network, capital equipment). The strategy of categorizing restructuring activities into several groups proves useful also in Kang and Shivdasani (1997), a study on restructuring in underperforming Japanese corporations. The latter study uses seven

[111] Further in the paper, the terms of 'channels of restructuring' and 'restructuring activities' are used interchangeably.

categories of restructuring activities,[112] however, most of them correspond to the categories used in Carlin et al. (1995).

In the present analysis, I use a categorization of restructuring obtained by combining the two above-mentioned studies. The set of restructuring types used here consists of five categories. They include all four dimensions used in Carlin et al. (1995), which correspond to the fist four groups of Kang and Shivdasani (1997), plus a category reflecting changes in control (the firth category in the latter study).[113] The five categories used here are labelled according to Kang and Shivdasani (1997). Each of the following subsections is devoted to one of the dimensions and contains a discussion of the expected effect of the corresponding dimension on company productivity.

6.3.1 Asset contraction policies

This dimension of restructuring activities refers to the sale of assets, spin-offs of units, and plant closures. For a large socialist-type SOE, all of these activities may be an important source of performance improvement. In order to improve efficiency, it is desirable to downsize, sell the least productive assets, and focus on the most profitable products (Grosfeld and Roland, 1995). All of these activities are also used in companies in market economies. Kang and Shivdasani (1997) report that 23 percent of the Japanese and 49 percent of the American companies in their sample[114] undertook an activity along this restructuring dimension. The main reason why a Japanese or U.S. company may decide to adopt an asset contracting policy is that some of the firm's operations could have become economically unviable. However, many of the SOEs' assets accumulated over the socialist times are by definition unviable or unprofitable. Social assets (e.g. day care centers,

[112] The categories used are the following: (i) asset contraction policies; (ii) changes in employment policies; (iii) expansion policies; (iv) internal reorganizations; (v) changes in control; (vi) external takeover activity; and (vii) miscellaneous actions.

[113] The remaining two categories of the latter study are not covered here. The 'miscellaneous actions' category is too heterogeneous, and I believe the activities covered there play only a minor role in the total effect of restructuring. To the contrary, the 'external control activity' category, including for example block purchases, may be quite important also in the Czech context. Unfortunately, our data set does not cover this kind of information.

[114] Their sample consists of 92 Japanese manufacturing firms listed on the Tokyo Stock Exchange and 114 U.S. manufacturing firms listed on the New York American Stock Exchanges during 1986 to 1990. Sample firms had a ratio of pretax operating income to assets that exceeds the industry median in a given year and experience a decline of at least 50% in operating income in the subsequent year.

recreational facilities) may serve as an example. Hence the need to use this kind of restructuring and its positive effect on productivity/performance is even more profound in the case of a former state-owned enterprise facing a new, changed environment.

The privatization policy adopted in the Czech Republic had a special effect concerning restrictions on assets sales, which deserves to be mentioned here. In particular, the Czech government decided to forbid asset sales in the companies until after the privatization (Grosfeld and Roland, 1995). The main reason was that privatization was regarded to be of higher priority and importance than restructuring. At the same time, this regulation served as an insurance against unfair dealings of managers immediately before privatization when they were relatively independent and with limited supervision. On the other hand, the program explicitly encouraged split-ups, which was reflected in a remarkable increase in the number of enterprises just before approval of privatization projects.[115]

These facts have obvious consequences for the present analysis. Since so many split-ups and hardly any asset sales occurred prior to the privatization, one can, without a substantial loss of information, focus only on asset sales when analyzing the restructuring activities in the companies after their privatization.

6.3.2 Changes in employment policies

Changes in employment policies include employee layoffs, wage differentiation or changes in incentive (compensation) schemes, and other actions that significantly affect the composition or compensation of the firm's employees.

Since labour hoarding was endemic in companies in planned economies, the need for labour shedding in the SOEs was obvious at the beginning of reforms (Pohl et al., 1997, Grosfeld and Roland, 1995). It was even strengthened by severe demand and price shocks resulting in significant fall in sales in the first years after the fall of the Berlin Wall. It is documented that SOEs across the region (even before privatization) indeed responded to the fall of their sales by lowering output, and consequently by considerable decrease of their labour levels (Carlin et al., 1995). Pursuing this line of argumentation, a negative

[115] The actual numbers of enterprises prior to and after the approval of privatization projects is 1179 and 3293, respectively (source: Ministry of Privatization, February 1994, quoted by Grosfeld and Roland, 1995).

relationship between employment change and (total factor) productivity can be expected in the companies where labour hoarding is still prevalent.

I argue that the privatized Czech companies experience excess employment even in the period after 1993, that is, at least two years after the first transition changes. Hence, I argue that labour hoarding is indeed still a problem in most of the newly privatized Czech companies in the early post-privatization period. Primarily, one might question the extent of labour shedding in the Czech companies before the privatization. Low unemployment levels[116] indicate that the companies laid off only as few employees as was necessitated by the fall of sales and output, but did not go any further in order to improve labour productivity. Consequently, after the sales of companies started to rise again, employment levels increased again proportionately. Of course, it might be argued that the low (in relation to Central European standards) unemployment was a result of faster job creation in the private sector. However, the problems at the end of 90s in the Czech Republic and revelation of existence of soft-budget constraints faced by the privatized companies rather suggest the first explanation (Dlouhy, 1999). Hence, I conclude that a negative effect of employment change on enterprise productivity can be still be conjectured even in the post-privatization period. Unfortunately, the framework of the production function estimation used in this study does not allow formally testing this type of restructuring activity.

The introduction of proper employee incentives is another restructuring activity that belongs to this group. The only evidence so far on the policies concerning changes in employee incentive schemes are case studies (Carlin et al., 1995). They document many examples where managers try to introduce some kind of wage differentiation. Furthermore, the case study evidence also documents the pressure for higher wages from the side of private sector forcing the SOEs not willing to lose skilled labour to increase wages.

Based on these facts, a positive relationship between labour costs and productivity can be conjectured. The argumentation is as follows. A natural way for a firm to introduce performance-improving incentives for its employees is to link wages to performance. This in turn means a widening of wage differentials. At the same time, however, there is a

[116] Unemployment in the Czech Republic has not exceeded 5% till 1997. On the contrary, it has been constantly higher than 10% in the other Visegrad countries.

pressure from the private sector to increase wages of well performing employees. Otherwise the well performing and skilled workforce switches to the better paying private sector. Consequently, employee incentive schemes and wage differentiation are associated with an increase of the total wage bill. A further argument in favour of this conjecture is the low unemployment level in the Czech Republic indicating that it is generally not difficult to switch jobs. Hence, a positive relationship between wages and enterprise productivity- is hypothesized in the present analysis.

6.3.3 Expansion policies

Actions along the expansion policy category enhance the scope or scale of operations. Such actions include the construction of new plants, increased output or capital expenditures.

The need for new investment (modernization of equipment or construction of new lines of production) in the former SOEs in transition countries was expressed in many studies (e.g., Blanchard, 1997, Grosfeld and Roland, 1995, and Carlin and Aghion, 1996). This fact is also supported by the very high obsoleteness of the firms' fixed assets.[117] At the same time, evidence (Carlin et al., 1996, and Zemplinerova et al., 1995) suggests that before 1993, the Czech SOEs undertook almost no major investment projects. Consequently, the need for investment in the post-privatization period is straightforward. Hence, I expect a positive relation between investment and productivity: the higher is the level of investment, the higher is the productivity of the company.

Evidence in the literature so far does not support this positive relationship for the Czech economy. Carlin and Landesmann (1997) point out that the high economy-wide ratio of investment to value added failed to translate into rapid productivity growth in the Czech Republic. The relatively high levels of investment in the Czech economy puzzled also Blanchard (1997). Carlin and Landesmann (1997) argue that a very large initial

[117] To document the level of fixed asset obsoleteness in the Czech firms, I compute a ratio of accumulated depreciation over total fixed assets. The average value of this ratio for the Czech non-financial enterprises with 25 and more employees is 44,2% for 1993. The number is computed based on sectional statistics published by the National statistical office, and includes both newly established firms as well as former SOEs. Since fixed assets of new firms are by definition relatively less obsolete and there has been considerable growth in the number of new firms in the Czech Republic since 1991, one may imply that the equipment obsoleteness of the old SOEs is remarkable.

devaluation of the national currency provided protection for all companies and thus enabled spreading of investment across all firms instead of its concentration in the most promising enterprises. Dlouhy (1999) provides another explanation. He argues that, in the Czech Republic, the amount of the 'productive investment' was relatively low, since total domestic investment was dominated by infrastructure and ecological investment (very often of mandatory nature). This fact then explains that the direct effect of investment on productivity could have been very weak (or even not present at all). Nevertheless, it is expected in the present analysis that modernization of equipment has positive effect on enterprise productivity.

6.3.4 Changes in control

The issue of changes in the top management and their association with improved performance is quite elaborated in the literature for developed economies (for an overview see Jensen and Zimmermann, 1985). In general, the findings support a positive relationship between changes in the top management and corporate performance or market valuation. However, in transition economies, the managerial labour market, the market for corporate control, and also the product market are not developed enough to create proper motivational pressures for managers. Instead, it is believed that new private owners achieve efficiency improvements by appointment of better managers and introduction of better incentives for the managers (Roland, 2000).

Several studies (e.g. Carlin et al., 1995, Claessens and Djankov, 1999) document that the market for managers is still underdeveloped in transition countries, and quality of managerial skills of the available managers is quite low. A survey of managerial positions conducted by Aspect kilcullen s. r. o.[118] illustrates the situation in the Czech Republic. According to this study, almost all incumbent managers (in 1995) were native Czechs. Only 5 percent of them had foreign university education, and less than 10 percent had some type of managerial education. Furthermore, a vast majority of the managers (around

[118] Adamek, Milan, 1995, 'Kdo jsou?,' (Who they are?) Průvodce českým trhem s cennými papíry (Czech capital market guide), Aspect kilcullen, p. 21.

90 percent) were appointed to the position in the pre-privatization period and survived also the change of ownership.

Furthermore, the literature provides a limited support for the hypothesis that bringing in new human capital is important in improving enterprise performance (for example, Barberis et al., 1996, Groves et al., 1995).[119] In the present analysis, I expect a positive shift in productivity after a change of the top manager.

6.3.5 Changes in internal organization

Internal reorganizations involve a restructuring without downsizing or enhancement of scale of the firms operations (Kang and Shivdasani, 1997). Examples of such activities include cost-cutting efforts, incorporating technological advances, changing production methods, or lowering of inventory levels. Many activities along this category are difficult to measure, in fact they often require development of qualitative rather than quantitative measures. These reasons together with data availability force me to focus only on inventory management here. As mentioned already in the sections above, resource wastage was endemic for the planned-economy enterprises (Carlin et al., 1995). Thus, a better inventory management should be one of the restructuring activities bring up better company performance. I conjecture that decreasing inventory levels are associated with increased productivity.

6.4 Data

The data used in the present analysis were purchased from Aspect kilcullen s.r.o., a consulting firm specializing in collecting accounting and trading data of firms traded at the Czech capital market. The database contains information on 1748 Czech firms. Several requirements were imposed on firms to be included into my sample. In particular, the sample contains only non-financial firms privatized via the voucher method for which financial report entries, information on CEO change, and data concerning number of

[119] Barberis et al. confirm this hypothesis on a sample of privatized Russian shops. Since the entities studied are not representative for the whole population of enterprises, generalization of the findings may not be possible.

employees is available for at least 4 years over the period from 1993 to 1998. In this way, I ended up with an unbalanced panel of 750 firms with 3220 observations.

Average values of basic indicators characterizing the firms over the whole time span and separately for each of the years are presented in Table 6.1 and Table 6.3, respectively. Table 6.2 lists the definitions of the variables used in the previous tables. The basic indicators reveal wide variation among the firms. The book value of total fixed assets of an average firm over the studied period (expressed in prices of 1993) was slightly more than CZK 800 million (approximately USD 28 million[120]). In general, the value of fixed assets increased steadily over the studied period. Average sales were CZK 934 million, with an increasing trend. Average employment was approximately 930 people. The total labour force was decreasing till 1996, thereafter increased slightly. One employee was able to produce CZK 1.03 million worth of sales (sale efficiency in constant prices of 1993) and was on average paid CZK 136 thousand per year (labour costs per employee). Sale efficiency was growing steadily, from CZK 0.96 million per employee in 1993 to CZK 1.12 million in 1998 (in constant prices of 1993). The wage bills of the companies were increasing in real terms over the whole period, though, with a decreasing rate. On average, the firms earned a gross margin of CZK 300 million, which constitutes

TABLE 6.1: BASIC STATISTICS FOR THE WHOLE TIME SPAN 1993-98

	units	# of obs.	mean	st. dev.	min	max
total sales[1]	mill. CZK	3220	934.44	2,725.11	0.140	46,400.0
sale efficiency[1]	mill. CZK	3220	1.03	1.24	0.001	19.7
gross margin[1]	mill. CZK	3171	300.96	1,256.67	-1,716	28,200.0
labour		3220	927.54	2,187.99	7	34,147.0
capital[1]	mill. CZK	3220	803.08	5,308.79	0.144	123,000.0
asset sale		3220	0.104	0.975	-0.036	51.636
labour cost[1]	mill. CZK	3220	126.01	374.05	0.001	6,310.5
labour cost change		3220	1.131	0.601	0.000	16.010
capital expenditures		3220	0.121	1.081	0.000	52.497
inventories		3220	0.110	0.107	-0.288	0.658
inventories change		3220	0.002	0.032	-0.660	0.307
bank		3220	0.171	0.148	0.000	0.884

Notes: Definitions of the variables are listed in Table 6.3. Growth variables defined as follows: change=var_t / var_{t-1}. [1] values are in constant prices of 1993. Logarithmic transformation is used in the regressions.

[120] Average exchange rate over the period was around CZK 28.8 per one USD.

TABLE 6.2: VARIABLE DEFINITIONS

Variable	Description
total sales	total sales in const. prices (log)
sale efficiency	total sales in const. prices / # of employees (log)
gross margin	(total sales – cost of sales) in const. prices (log)
labour	number of employees (log)
capital	book value of total fixed assets in cost. prices (log)
asset sale	book value of fixed assets sold / total fixed assets
labour cost	price adjusted wages and wage taxes (log, lagged)
labour cost change	wages and wage taxes / wages and wage taxes lagged
capital expenditures	increase in fixed assets / total fixed assets
inventory level	raw material or supplies level / current assets
inventory change	raw material or supplies change over year / current assets
bank	book value of bank loans / total assets
CEO change	dummy variable that is set to one following a CEO change

approximately one third of their total sales. This indicates a quite low profitability level of the firms in the sample. Moreover, the gross margin was declining from CZK 448 million in 1994 to 270 million in 1998 (in constant prices of 1993).

On average, the firms in our sample sold 10 percent of their fixed assets per year. Table 6.3 indicates an increasing trend of asset sales, with a peak in 1996 when 16 percent of the firms' fixed assets were sold. This indicates that firms were quite active in their asset contraction policies. To the contrary, capital expenditures constituted, on average, 12 percent of total fixed assets every year. Generally, capital expenditures experience a declining trend, with only 6 percent of fixed assets in 1998. Nevertheless, firms seem to invest into fixed assets relatively the same amount as they divest. Bank loans represented 17 percent of total company assets. The firms slightly increased the funds borrowed from banks from 16 percent to 18 percent of their assets over 1994-98.

In summary, the basic statistics in Tables 6.1 and 6.3 indicate that the privatized firms increased their performance and productivity in the 5-6 years following their privatization. The tables also document some restructuring efforts of the firms concerning asset contraction, labour shedding, investment and managerial turnover.

TABLE 6.3: MEANS AND STANDARD DEVIATIONS OF THE MAIN VARIABLES BY YEARS

	units	**1994**	**1995**	**1996**	**1997**	**1998**
number of observations		478	709	741	657	635
total sales[1]	mill. CZK	1,085.22	877.13	853.36	941.65	972.08
		(2,975.46)	(2,605.39)	(2,552.39)	(2,738.43)	(2,840.89)
sale efficiency[1]	mill. CZK	0.96	0.97	1.01	1.09	1.12
		(1.10)	(1.11)	(1.14)	(1.36)	(1.43)
gross margin[1]	mill. CZK	448.05	303.20	261.43	262.92	270.82
		(1,621.81)	(1,246.13)	(1,181.90)	(1,117.44)	(1,159.22)
labour		1,189.63	891.49	867.13	883.86	886.17
		(2,551.97)	(2,065.14)	(2,130.74)	(2,162.30)	(2,108.55)
capital[1]	mill. CZK	892.09	704.37	732.39	833.23	897.58
		(4,876.77)	(4,529.09)	(5,010.09)	(5,705.85)	(6,267.15)
asset sale		0.050	0.067	0.161	0.117	0.105
		(0.130)	(0.147)	(1.911)	(0.574)	(0.425)
labour cost[1]	mill. CZK	140.25	113.48	117.82	130.39	134.30
		(372.36)	(336.28)	(360.47)	(402.86)	(399.60)
labour cost change		1.294	1.144	1.130	1.099	1.031
		(1.236)	(0.334)	(0.362)	(0.568)	(0.204)
capital expenditures		0.136	0.142	0.107	0.161	0.063
		(0.911)	(0.777)	(0.409)	(2.064)	(0.164)
inventories		0.098	0.118	0.122	0.109	0.099
		(0.116)	(0.118)	(0.105)	(0.095)	(0.098)
inventories change		0.006	0.013	0.003	-0.004	-0.006
		(0.038)	(0.037)	(0.028)	(0.033)	(0.019)
bank		0.157	0.162	0.177	0.178	0.177
		(0.127)	(0.141)	(0.147)	(0.156)	(0.162)

Notes: Number of observations for profit margin is 478, 709, 738, 654, and 592 for the years 1993-98, respectively. Standard deviations in brackets. Definitions of the variables are listed in Table 6.3. Growth variables defined as follows: change=var_t / var_{t-1}. [1] values are in constant prices of 1993. Logarithmic transformation is used in the regressions.

6.5 Methodology

A wide variety of measures of performance improvement in companies in transition countries have been used in the relevant literature. The prevalently used measure is the labour productivity, defined as real sales per employee (Earle and Estrin, 1998, Pohl et al., 1997, Frydman et al., 1998, and Linz and Krueger, 1998, among others). Usually, productivity change is used. Only studies on Russia and former Soviet republics prefer to

use labour productivity level instead of change, arguing that because of hyperinflation and massive changes in relative prices, productivity growth is hard to measure (Earle and Estrin, 1998).

In the present study, a production function framework is used to assess the performance-improving effect of different restructuring activities. This is a standard method used in the empirical IO literature (see for example Nickell, 1996) that allows connecting the assessed effects (coefficients) of individual restructuring activities with the total factor productivity. At the same time, it is still comparable to the common measures mentioned above. The basic regression equation has the following form:

$$log\ Y_{it} = \alpha_i + \beta_1\ log\ K_{it} + \beta_2\ log\ L_{it} + Rest_{it}\ \gamma + \varepsilon_{it} \qquad (1)$$

where Y_{it} represents the total price adjusted sales of firm i in year t, K_{it} stands for the firm price adjusted capital (fixed assets), L_{it} is the labour (number of employees), α_i is the firm-specific constant (fixed effect), and ε_{it} is the error term. The basic production function framework is augmented by variables measuring the restructuring activities in firms. In equation (1), they are represented by the matrix $Rest_{it}$. Consequently, γ represents a vector of the coefficients of interest.

Frydman et al. (1998) highlight the importance of the revenue side of profit statements as the one with a much more direct relation to the entrepreneurial ability of managers to manoeuvre in a new environment. Moreover, the authors argue further that cost relations are more predictable for company insiders, and are often only a matter of will and standard procedures, especially if large inefficiencies are obvious. In order to follow this line of reasoning, I estimate another alternative of equation (1). In particular, in addition to total sales (price adjusted) I include also profit margin (price adjusted), as the dependent variable.[121]

Table 6.4 lists the five basic groups of restructuring activities that are discussed in the hypothesis section. Moreover, the table provides the basic proxies measuring the activities along these dimensions, and their expected effect on firm productivity. I include bank loans as an additional variable into the analysis in order to measure softness of firms' budget constraint.

[121] Value added is also sometimes used as measure of output in the production-function framework (see, for example, Basu and Fernald, 1995).

TABLE 6.4: CHANNELS OF RESTRUCTURING AND THEIR MEASUREMENT

Channel of restructuring	Variable	Expected effect on performance
Asset contraction policies	Asset sale	positive
Changes in employment policies:		
employee incentives	Labour cost, lagged	positive
	Labour cost change	positive
Expansion policies:		
modernization of equipment	Capital expenditures	positive
Changes in control	Change of CEO	positive
Internal reorganizations:		
inventory management	Inventory level	negative
	Inventory change	negative
Fund availability / soft budget constraint	Bank loans	?

Notes: Definitions of all the variables are listed in Table 6.3. A question mark indicates that the relationship is ambiguous.

Equation (1) is estimated using fixed-effects panel regressions. This method of estimation provides better estimators than simple OLS (and random-effects estimates) when the explanatory variables are correlated with the error term. It is quite probable that there is correlation between unobservable individual characteristics of the firms (which are captured by the error term of the OLS regression), and some of the explanatory variables in my data set. For example, a good manager (individual effect) could be more able to attract skilled employees and differentiate wages (labour cost is explanatory variable). Therefore, if OLS were used, coefficient estimates would be biased. In particular, in the case of the correlation between wages and managerial abilities, the effect of wages on firm performance would be overestimated. A fixed-effects model can solve the problem of correlation. In the fixed effects model, the differences across firms are captured by the differences in constant term (see Greene, 1993, pp. 444-485 as a general reference on panel-data regressions). Hence, the part of the error term causing correlation with the explanatory variables is taken out and included in the regression as a set of individual dummy variables.

6.6 Results

Table 6.5 summarizes the regression estimates. The first two columns correspond to equation (1) with logarithm of total sales in constant prices as the dependent variable. The model in the first column includes time dummies, while the second model (in the second column) includes a separate dummy for each industry-year to correct for possible industry biases. The last two columns correspond to similar models with profit margin as the dependent variable. The Hausman test (not reported) suggests that fixed-effects models should be used in all specifications.

TABLE 6.5: FIXED EFFECTS ESTIMATES

	sales				**profit margin**			
labour	0.272	***	0.291	***	0.352	***	0.295	***
	(0.045)		(0.046)		(0.089)		(0.091)	
capital	0.480	***	0.492	***	0.464	***	0.469	***
	(0.024)		(0.025)		(0.047)		(0.048)	
asset sales	0.067	***	0.066	***	0.052	***	0.051	***
	(0.007)		(0.007)		(0.013)		(0.013)	
employee incentives	0.067	***	0.069	***	0.094	***	0.080	***
	(0.011)		(0.011)		(0.022)		(0.022)	
fixed asset investment	-0.017	**	-0.017	**	0.013		0.011	
	(0.007)		(0.007)		(0.013)		(0.013)	
CEO change	0.073	***	0.047	**	-0.050		0.018	
	(0.021)		(0.022)		(0.041)		(0.043)	
inventory management	0.381	*	0.465	**	0.639	*	0.593	
	(0.196)		(0.198)		(0.379)		(0.381)	
bank loan	-0.009		-0.075		-0.206		-0.052	
	(0.095)		(0.097)		(0.275)		(0.275)	
time dummies	yes				yes			
time-industry dummies			yes				yes	
number of observations	3220		3220		3171		3171	
R^2	0.205		0.239		0.113		0.160	

Notes: Estimated by OLS, fixed effects included in both regressions. Standard deviations are in parentheses. *Employee incentives* are measured by labour cost change, *inventory management* by inventory level. Definitions of all the variables listed in Table 6.3. *** denotes significance at the 1% level. ** denotes significance at the 5% level. * denotes significance at the 10% level.

In general, these two variants of the production function show similar results (except for the CEO-turnover effect) leading to the same conclusions concerning the productivity

effect of the restructuring activities. The first two columns indicate that asset sales have positive effect on firm productivity. This means that firms that get rid of assets (most probably unproductive assets) are associated with higher (total factor) productivity and constitutes evidence that the newly privatized firms take asset-contraction actions that lead to higher productivity.

To the contrary, capital expenditures are associated with a negative effect: firms that enlarge their fixed-asset base perform poorer.[122] This is against my expectation and suggests that firms do not invest in order to become more productive. The expansion policies do not work yet. This result may confirm the conjecture drawn by Dlouhy (1999) that firms invest in unproductive, ecological assets (investments of compulsory nature that reduce ecological damage to environment). At the same time, the finding supports the conclusion of Carlin and Landesmann (1997) that investment in the Czech companies is not distributed among companies in order to improve performance but rather scattered across all the firms without any effect on performance. However, one has to be careful not to draw very strong conclusions, as the regression estimates only the productivity effect of an investment over the last year. Still, it may well be that the impact of an investment project is spread over a longer time period or/and the impact becomes pronounced only in later years as it may take some time for the investment to become functional and effective.

Employee incentives, measured by labour cost changes are found to have a significantly positive effect on productivity.[123] Also, CEO change delivers higher productivity indicating that the new owners are able to appoint managers with better skills that more suit the productive assets of the companies. The positive coefficient documents a positive productivity shift caused by the managerial change: productivity after the change is higher compared to the pre-change productivity. Control changes are an effective restructuring tool.

The coefficient corresponding to the inventory management variable has a positive sign, which contradicts my expectation. Decreased inventory levels should indicate better inventory management that should increase productivity.

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[122] The coefficient estimates in the third and fourth columns are positive but insignificant leading to the same conclusions.

[123] Regression results with lagged wage level result in the same conclusion.

Finally, the results suggest that bank loans are not associated significantly with firm productivity. This indicates that bank loans are distributed among companies regardless of their performance/productivity. A positive relationship would indicate that higher availability of bank loans impacts productivity in a positive way: firms that are able to increase their bank loans consequently increase their efficiency. Hence, a positive coefficient would indicate that the bank funds are used in an efficient way. To the contrary, the estimated insignificant coefficient, at least weakly, documents the non-existence of a hard budget constraint among the firms. It may also indicate that banks do not allocate their loans based on an efficiency criterion (the more productive firms get more loans). To the contrary, the banks rather extend (refinance) their existing loans to inefficient firms.[124]

In summary, most of the results are in line with what is expected. Asset sales are positively associated with performance, positive wage changes motivate employees to reach higher productivity, and also CEO change improves performance. In contrast, fixed asset investment and inventory management have an opposite effect to what is expected. So, my results indicate that the privatized-firms' activities along the expansion-policy and internal-reorganization dimensions are not sufficient in order to impact productivity in a positive away. Finally, the insignificant regression estimate for bank loans documents that bank loans are not related to productivity. This suggests, at least weakly, the existence of a soft budget constraint.

The regression results for models in the second two columns lead to only one important difference that deserves mentioning. The coefficient corresponding to the CEO change dummy turns to be insignificant in this specification. It indicates that even though the new managers are able to increase (total factor) productivity, this effect turns insignificant once costs of goods sold are accounted for. It may lead to a conclusion that managers do not watch costs, they rather focus on increasing sales. In accordance with the argument of Frydman et al. (1998), costs should be relatively predictable. Therefore, costs reduction should be only a question of the will of managers. However, Nickell (1996) uses the effect of competition to provide another plausible explanation: an increasingly

[124] Roland (2000) argues that this strategy may indeed be optimal for banks with a large portfolio of non-performing loans and high prospects of bailout by the state.

competitive environment may have profitability decreasing effect (higher competition means lower profit margins) but encourages efficiency improvements. Plausibly, competition in the Czech economy has increased since the onset of reforms. It may, in fact, have negative effect on profitability of firms despite their increasing productivity. Thus, our findings may not be contradictory: the new owners introduce new managers who increase productivity but increasing product-market competition causes that the profit gains are insignificant.

6.7 Conclusions

In summary, the results of the present study are fourfold. First, the study identifies that asset sales, employee incentives, and CEO change have a productivity improving effect. However, when output is measured by the profit margin (instead of total sales), the effect of the CEO change turns insignificant. This result may indicate that increased product-market competition may have negative effect on profitability but still positive effect on productivity.

The second main conclusion is that fixed-asset investment of the newly privatized firms has, contrary to my expectation, a negative effect on productivity. This finding supports the conjecture of Carlin and Landesmann (1997) that an investment in the Czech economy is dispersed among all firms and does not concentrate only in the best firms with the highest returns. Third, the availability of bank loans does not have any effect on performance, which can be interpreted as an indication that hard-budget constraint is not imposed on the companies. Finally, the results do not offer any support for presence of efficient inventory management in the companies.

A possible implication of the present analysis is that the ownership structures may not be efficient in delivering deep restructuring connected with efficient investment policies. However, based on the results of the present study, it is not possible to draw clear and definitive conclusions concerning the corporate-governance structures employed by the companies. Further research is desirable to shed some light on the relationship between ownership patterns and channels of restructuring leading to improved efficiency. In addition, future research is to include more countries (for example, all Visegrad countries)

in a similar analysis. Such an exercise might indicate how different policies in terms of privatization, liberalization, and enforcement of the budget constraint affect the extent and speed of restructuring.

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Samenvatting

Moerland (1997, pagina 661)[125] definieert corporate governance ofwel vennootschappelijke besturing als "het geheel van structuren, regelingen en conventies dat bepalend is voor de wijze waarop en de effectiviteit waarmede een vennootschap – door middel van een door prikkels en tucht geregeerde interactie tussen stakeholders – wordt bestuurd en gecontroleerd". Bij de vennootschappelijke besturing is een bijzondere rol weggelegd voor grootaandeelhouders. Hoewel vaak wordt verondersteld dat grootaandeelhouderschap een belangrijk onderdeel vormt van het Continentaal Europese corporate governance bestel, is de grootaandeelhouder van toenemend belang in de Anglo-Saksische markteconomieën met wijder verspreiding van het aandelenbezit.

In deze dissertatie wordt de rol van grootaandeelhouders vanuit twee gezichtspunten bestudeerd. In het eerste gedeelte van de dissertatie staat de rol van grootaandeelhouders in het Verenigd Koninkrijk centraal. Anders dan in Continentaal Europa, kent het Verenigd Koninkrijk een lange traditie van wijde verspreiding van het aandelenbezit. Er wordt gekeken naar of de koersreactie die volgt op het bericht van handel met voorkennis verschilt al naar gelang er een grootaandeelhouder deel uitmaakt van de eigendomsstructuur. Het tweede gedeelte van het proefschrift handelt over de rol van nieuwe particuliere eigenaren bij het herstructureren van voormalige staatsbedrijven in een transitie economie. In een transitie economie bestaat de noodzaak tot het doorvoeren van

[125] Moerland, Piet W., 1997, 'Corporate Governance: Schakering, Reikwijdte en Definiëring,' Maandblad voor Accountancy en Bedrijfseconomie 71, 657-665.

efficiency verbeteringen door kundige managers. De hoge mate van onzekerheid over de toekomst en informatie asymmetrie vereisen een effectieve vennootschappelijke besturing. Ondernemingen en hun stakeholders worden in een transitie economie geconfronteerd met gebrekkige markt instituties en moeten op zoek naar vervangende mechanismen (zoals contract naleving, reputatie, concurrentie in de product markt en de arbeidsmarkt voor managers). Geconcentreerd aandeelhouderschap lijkt eveneens een oplossing te bieden. Ondanks deze twee uiteenlopende perspectieven omtrent grootaandeelhouderschap zijn de twee onderdelen van het proefschrift in hoge mate complementair en verschaffen tezamen een diepgaande analyse van de rol van grootaandeelhouders. Hierna volgt een korte samenvatting van de resultaten van de twee studies.

De belangrijkste bijdrage van het eerste gedeelte van het proefschrift is dat het twee onderwerpen combineert – enerzijds handel in eigen aandelen door interne aandeelhouders en anderzijds corporate governance. Interne aandeelhouders, gedefinieerd als managers en directeuren (in de Verenigde Staten ook grootaandeelhouders) beschikken vaak over superieure informatie over de onderneming en haar vooruitzichten in vergelijking tot externe minderheidsaandeelhouders. Deze informatie voorsprong kan door interne aandeelhouders in klinkende munt worden omgezet door te handelen in de eigen aandelen. Dit roept vragen op omtrent de rechtvaardigheid en efficiency van financiële markten en heeft geleid tot een grote hoeveelheid theoretische en empirische onderzoeken. Hoofdstuk 2 biedt een overzicht van deze literatuur.

Hoofdstuk 3 bestudeert de koersreactie die volgt op de bekendmaking van handel in eigen aandelen door directieleden in dienst van beursgenoteerde bedrijven uit het Verenigd Koninkrijk gedurende 1991 tot 1998. De resultaten onderschrijven eerdere bevindingen dat handel in eigen aandelen door directieleden nieuwe informatie verschaft over de toekomstige vooruitzichten van de onderneming. Zowel aankopen en verkopen door directieleden gaan gepaard met significante koersreacties. De koersreactie voor aankopen van eigen aandelen is echter hoger. De markt lijkt minder informatie inhoud toe te kennen aan verkopen door directieleden aangezien een gedeelte van de verkopen kan worden verklaard door de wens van directieleden om hun persoonlijke vermogen te spreiden.

De voornaamste bijdrage aan de literatuur is echter de studie naar hoe de aanwezigheid van een externe grootaandeelhouder op de informatie inhoud die valt toe te kennen aan de handelstransacties van directieleden. Hierbij wordt gekeken of de cumulatief abnormale rendementen volgend op de aankondiging van een handelstransactie verschillen bij de aanwezigheid van verschillende soorten grootaandeelhouders. We verwachten dat beleggers de aanwezigheid van een grootaandeelhouders meenemen bij het reageren op de informatie die uitgaat van de handelstransactie van directieleden. Onze resultaten ondersteunen deze hypothese. Beleggers maken een onderscheid tussen grootaandeelhouders die toezicht houden op het management en die grootaandeelhouders die geen toezicht uitoefenen. Indien ondernemingen, of particuliere beleggers of families zonder band met het management als grootaandeelhouder fungeren, is de koersreactie die gepaard gaat met de aankoop en verkoop van eigen aandelen door directieleden minder groot. Dit doet vermoeden dat deze grootaandeelhouders de informatieasymmetrie mitigeren. De aanwezigheid van financiële instellingen als grootaandeelhouder heeft het tegenovergestelde effect: de markt reageert meer positief (negatief) volgend op aankopen (verkopen) van directieleden. Dit betekent dat financiële instellingen de informatie verschil tussen externe beleggers en interne aandeelhouders niet weten te overbruggen, maar dat zij de handelstransacties van directieleden volgen.

Bovendien tonen onze resultaten dat de markt de machtspositie van en verantwoording door interne aandeelhouders belangrijk acht om de informatie inhoud van de handelstransacties van directieleden te bepalen. Voor ondernemingen met omvangrijk aandelenbezit door interne aandeelhouders, wordt het positieve nieuws van de aankoop van eigen aandelen door directieleden gemitigeerd doordat deze door de aankoop extra macht verwerven en zich minder hoeven te verantwoorden jegens de overige aandeelhouders. Tegelijkertijd reageert de markt minder negatief wanneer interne aandeelhouders met een groot aandelenpakket een gedeelte van hun aandelenbezit verkopen. De verkoop verkleint immers de machtspositie van interne aandeelhouders binnen de onderneming. Tot slot, vinden we een grotere koersreactie wanneer de onderneming slecht presteert (verliesgevend is of haar dividend vermindert), zich op de rand van faillissement bevindt (gering interestdekkingsgetal) of een onderneming is met hoge groei.

Het tweede gedeelte van deze dissertatie handelt over de acties ondernomen door particuliere eigenaren in Tsjechië om efficiency verbeteringen en winstgevendheid te vergroten in voormalige staatsbedrijven. De privatisering van staatsbedrijven vormt een belangrijk onderdeel van het hervormingsprogramma in alle transitie economieën met als doel hun centraal geleide economieën te veranderen in markteconomieën. In Tsjechië, heeft de voucherprivatisering gezorgd voor een relatief snelle overdracht van eigendom van de staat aan private eigenaren. Hoofdstuk 4 beschrijft het voucher privatiseringsprogramma, het privatiseringsproces en benadrukt de belangrijkste eigenschappen en gevolgen van het programma.

Hoofdstuk 5 en 6 analyseren de herstructureringsactiviteiten van de geprivatiseerde Tsjechische bedrijven in de periode na de privatisering. De dataset bestaat uit 917 bedrijven gedurende de periode 1993 tot 1998. In markteconomieën, bepalen de financiële prestaties van ondernemingen mede of de het dienstverband van de topmanager zal worden voortgezet. Hoofdstuk 5 onderzoekt de relatie tussen de financiële prestaties van de onderneming en het vertrek van de topmanager. We testen of de nieuwe private eigenaren bij de keuze of de manager moet worden vervangen worden beïnvloed door de relatieve prestaties van het bedrijf. De resultaten tonen dat de invloed van de geleverde prestaties gedurende de eerste jaren na de privatisering niet van invloed zijn op de keuze de manager al dan niet te vervangen. Echter in 1997 (zo'n 3-4 jaar na de privatisering) wordt het effect wel significant. Dit is met name het geval voor ondernemingen met minder geconcentreerde eigendomsstructuren en ondernemingen waarin privatiseringsfondsen belangrijke aandeelhouders zijn. Wij verklaren dit doordat grootaandeelhouders nauwer betrokken zijn bij de onderneming en over meer informatie beschikken over de kwaliteit van de manager. Deze grootaandeelhouders gaan derhalve over tot vervanging van de topmanager als er een mogelijkheid bestaat tot prestatieverbetering alhoewel de relatieve prestatiemaatstaven (in vergelijking tot andere bedrijven in de bedrijfstak) geen slechtere prestaties tonen.

Onze tweede bevinding bevestigt deze propositie. Wanneer de productiviteit van de onderneming voor en na de vervanging van de topmanager wordt bekeken, vinden we dat er een positieve verandering plaatsvindt in (totale factor) productiviteit. Dit suggereert dat de nieuwe particuliere eigenaren handelen op basis van superieure informatie over het

onvervulde potentieel tot efficiency verbetering en in staat zijn managers te benoemen die deze verbeteringen weten te realiseren. De derde bevinding is dat deze efficiencyverbetering door benoeming van een nieuwe topmanager alleen dan significant is wanneer de oude topmanager een relatieve sterke positie heeft binnen de onderneming en een nauwe relatie heeft met de andere directieleden (die gezamenlijk verantwoordelijk zijn voor het ondernemingsbeleid).

De literatuur over transitie economieën beschrijft uiteenlopende mogelijkheden tot herstructurering in de pre-privatiseringsperiode. Hoofdstuk 6 toont een analyse van de verschillende kanalen om te herstructureren in de post-privatiseringsperiode voor een steekproef van Tsjechische bedrijven. De resultaten tonen dat de verkoop van activa, prikkels voor werknemers, en vervanging van de topmanager als kanalen tot verbetering van de (totale factor) productiviteit dienen. Daarentegen leiden investeringen in activa en voorraadbeheer niet tot verbeterde productiviteit. Daarnaast toont het onderzoek aan dat de beschikbaarheid van bankleningen geen verbetering van de productiviteit tot stand brengt. Dit kan worden gezien als een indicatie dat ook minder goed presterende ondernemingen in staat zijn om bankleningen aan te trekken.

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